SLV-ED8KR/ED9KR

RMT-V244/V246

SERVICE MANUAL

Korean Model

Photo: SLV-ED8KR

S MECHANISM

Hi-Fi

G-CODE

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

* The abbreviations of ED8 and ED9 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	ED8	ED9
All model names SLV-	ED8KR	ED9KR

SPECIFICATIONS

System

Format
VHS NTSC standard
Video recording system
Rotary head helical scanning FM system
Video heads
Double azimuth four heads
Video signal
NTSC color, EIA standards
Tape speed
SP: 33.35 mm/s (1 3/8 inches/s)
EP: 11.11 mm/s (7/16 inches/s)
LP: 16.67 mm/s (11/16 inches/s), playback only
Maximum recording/playback time
8 hrs. in EP mode (with T-160 tape)
Fast-forward and rewind time
Approx. 3 min. (with T-120 tape)

Tuner section

Channel coverage
VHF 2 to 13
UHF 14 to 69
CATV A-8 to A-1, A to W, W+1 to W+84
Antenna
75-ohm antenna terminal for VHF/UHF

Inputs and outputs

LINE-1 IN and LINE-2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jack (2 each)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE-1 OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms
LINE-2 OUT (AUDIO)
AUDIO OUT, phonojack (2)
Standard output: 327 m Vrms
Load impendance: 47 kilohms
Output impedance: less than 10 kilohms

Timer section

Clock
Quartz locked
Timer indication
12-hour cycle
Timer setting
8 programs per month (max.)
Power back-up
Built-in self-charging capacitor
Back-up duration: up to 1 hour at a time

General

Power requirements
110 - 220 V AC, 60 Hz
Power consumption
21 W
Operating temperature
5°C to 40°C
Storage temperature
–20°C to 60°C

– Continued on next page –

VHS VIDEO CASSETTE RECORDER

MICROFILM

SONY

Dimensions
Approx. 430 × 100 × 286 mm (w/h/d)
including projecting parts and controls
Mass
Approx. 5.9 kg

Supplied accessories

Remote commander (RMT-V246) (1) : ED8
Remote commander (RMT-V244) (1) : ED9
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
Audio/video cable (3-phono to 3-phono) (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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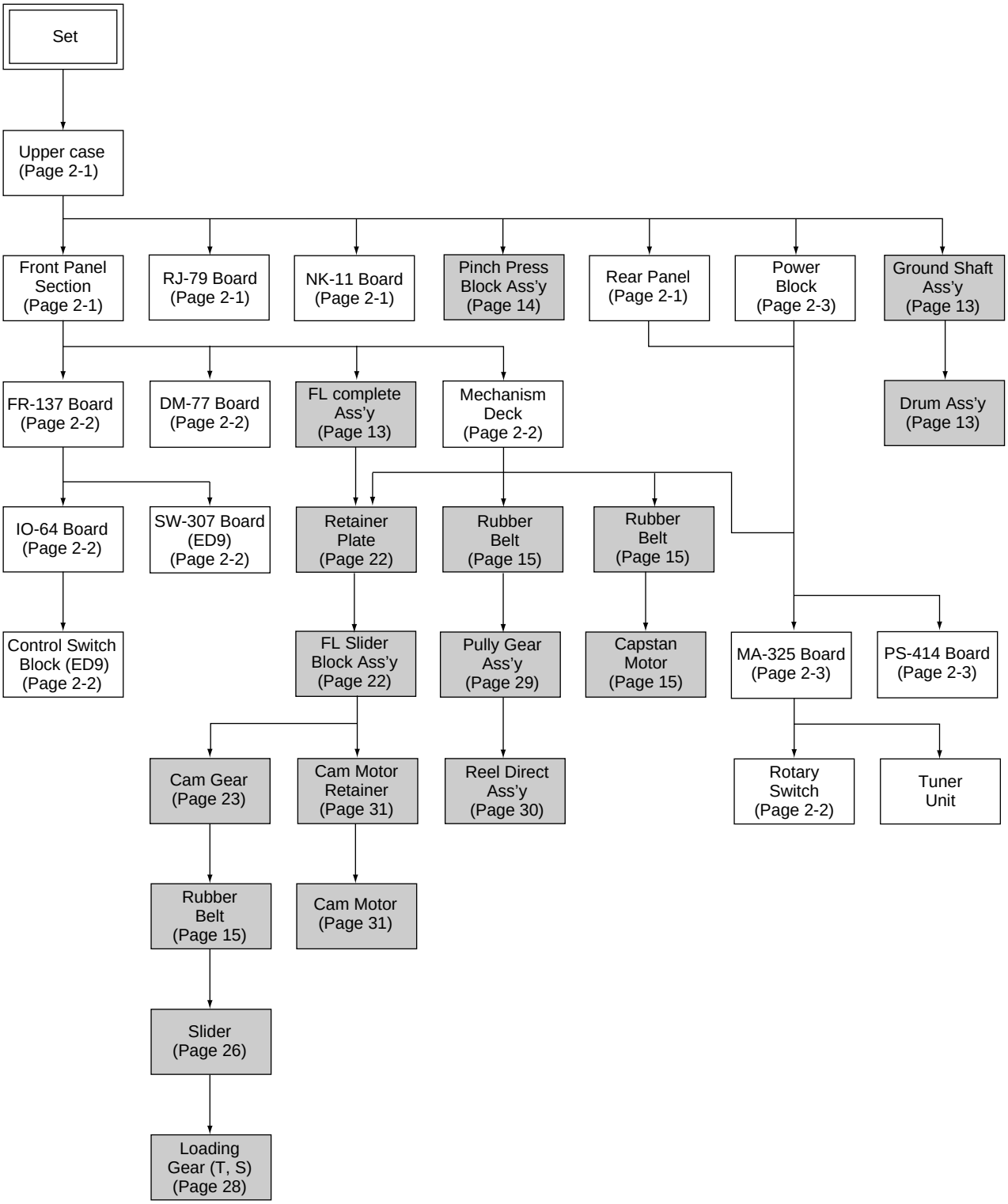
SERVICE NOTE

1. DISASSEMBLY

• This set can be disassembled in the order shown below.

Note: Pages in ▭ indicated pages in the SERVICE MANUAL.
Pages in ▭ indicated pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.


Set
Upper case (Page 2-1)
Front Panel Section (Page 2-1)
RJ-79 Board (Page 2-1)
NK-11 Board (Page 2-1)
Pinch Press Block Ass'y (Page 14)
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Rubber Belt (Page 15)
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Cam Gear (Page 23)
Cam Motor Retainer (Page 31)
Reel Direct Ass'y (Page 30)
Rotary Switch (Page 2-2)
Tuner Unit
Rubber Belt (Page 15)
Cam Motor (Page 31)
Slider (Page 26)
Loading Gear (T, S) (Page 28)

SECTION 1 GENERAL

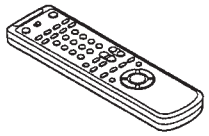
This section is extracted from SLV-ED8KR instruction manual (3-861-812-11).

Step 1

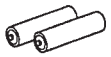
Unpacking

Check that you have received the following items with the VCR:

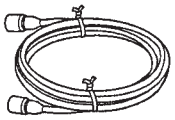
- Remote commander



- Size AA (R6) batteries



- 75-ohm coaxial cable with F-type connectors



- Audio/video cable (3-phono to 3-phono)

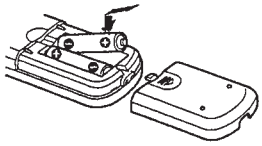
Step 2

Setting up the remote commander

Inserting the batteries

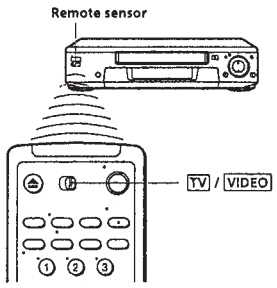
Insert two size AA (R6) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the ■ symbol near the remote sensor, this remote commander will not operate the TV.



To operate	Set TV/VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

You can use the WIDE button with a Sony wide TV only. Press WIDE to switch the wide picture mode on or off.

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

continued

Step 2: Setting up the remote commander (continued)

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV/VIDEO at the top of the remote commander to TV.

2 Hold POWER down, and enter your TV's code number(s) using the number buttons. Then release POWER.

Now you can use the POWER, VOL +/–, CH +/– and TV/VIDEO buttons to control your TV. You can also use the buttons marked with a dot (•) to control a Sony TV. To control the VCR, reset TV/VIDEO to VIDEO.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Manufacturer	Code number
Sony	01
Akai	04
AOC	04
Centurion	12
Colonad	03
Curis-Mathes	12
Emerson	03, 04, 14
Fisher	11
General Electric	06, 10
Gold Star	03, 04, 17
Hitachi	02
JVC	09
Magnavoc	08
Marantz	13

Manufacturer	Code number
MGA/Mitsubishi	13
Panasonic	06, 19
Philips	08
Pioneer	16
Quasar	06
Radio Shack	05, 14
RCA	10
Sanyo	11
Sears	07, 11
Sharp	05, 18
Sylvania	08
Teknika	14
Toshiba	07
Zenith	15

Notes

- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- You may not be able to use some buttons to control non-Sony TVs due to the remote commander's signal limitations.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number may automatically reset to 01 (Sony). If your TV is not a Sony, it is recommended to manually set the appropriate code number every time you replace the batteries.

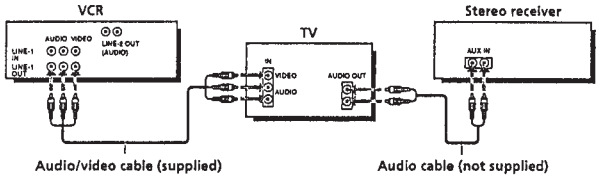
Step 3

Hookup

Audio/video (A/V) hookup

If your TV has audio/video (A/V) input jacks, you will get a better picture and sound when you hook up your VCR using these connections. In addition, for a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system. If your TV doesn't have A/V inputs, see the following page for antenna hookup.

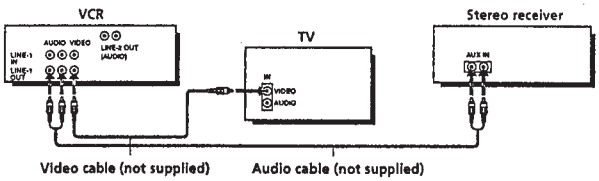
A Use this hookup if your TV has stereo jacks



Tip

- If you want to use the Trinitron TV Synchro Play function (see page 23), this connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)

B Use this hookup if your TV doesn't have stereo jacks



Note

- You can also improve sound quality by connecting LINE-2 OUT (AUDIO) on the VCR to the stereo system.

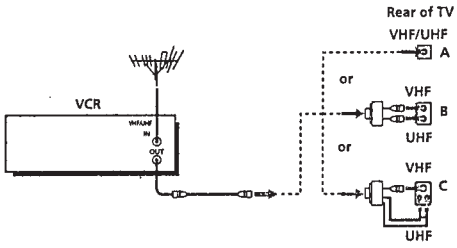
continued

Antenna hookup

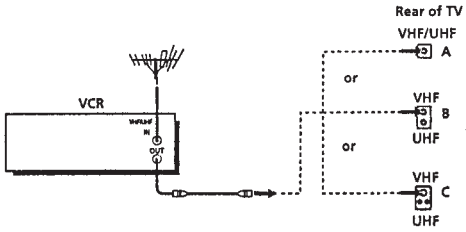
Make the following connections when you're using an antenna.

A Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2–13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



B Use this hookup if you're using a VHF-only antenna (you get channels 2–13 only)



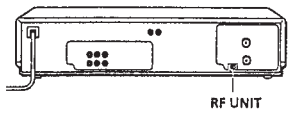
If you cannot connect your antenna cable to the VCR directly

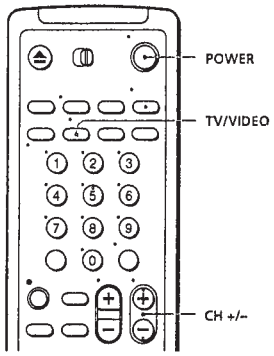
If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 48.

Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.

If you made A/V connections (page 7) you can skip this step.





1 RF UNIT CH3 CH4 — Set the RF UNIT switch on the rear of the VCR to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

2 • POWER — Press POWER to turn on the VCR.

3 • TV/VIDEO — Press TV/VIDEO on the remote commander to turn on the VIDEO indicator in the VCR's display window.

4 • CH — Press CH +/– to display a channel number in the display window. Select an active channel number in your area.

5 Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).

The selected TV channel broadcast appears on the TV screen. If the channels change when you press CH +/–, you have made the correct setting.

Whenever you use the VCR, set the TV to the channel selected in step 1.

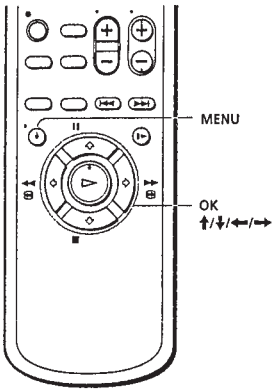
Step 4

Setting the clock

Set the time and date to use the timer feature for recording programs.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



1 • MENU — Press MENU.

```
MENU
▶TIMER SET / CHECK
  SET UP MENU
  TUNER PRESET
  SET G-CODE CHANNELS
  CLOCK SET
SELECT  :[↑↓]
SET     :[OK]
```

2 Press ↑/↓ to move the cursor (▶) to CLOCK SET, then press OK.

```
CLOCK SET
▶1/1/1998 THU 12:00AM
SELECT  :[←→]
SET     :[↑↓]
END     :[OK]
```

3 Press ↑/↓ to set the month.

```
CLOCK SET
▶1/1/1998 SUN 12:00AM
SELECT  :[←→]
SET     :[↑↓]
END     :[OK]
```

4 Press → to flash the day and press ↑/↓ to set the day.

The day of the week is set automatically.

```
CLOCK SET
11/▶1/1998 MON 12:00AM
SELECT  :[←→]
SET     :[↑↓]
END     :[OK]
```

5 Set the year, hour and minutes in sequence, using → to flash the item to be set, and ↑/↓ to select the digits.

```
CLOCK SET
11/16/▶1998 MON 12:00AM
SELECT  :[←→]
SET     :[↑↓]
END     :[OK]
```

6 Press OK to start the clock.

Tip

- To change the digits during setting, press ← to return to the item to be changed, and select the digits using ↑/↓.

Note

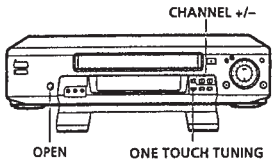
- The menu disappears automatically if you don't proceed for more than a few minutes.

Step 5

Presetting channels

First, we recommend that you preset the receivable channels in your area using one touch tuning. You can also preset the channels automatically using the menu. Then, if some channels could not be preset automatically, set them manually; if there are any unwanted channels among the preset ones, you can disable the channels.

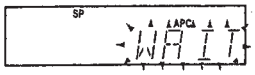
Presetting all receivable channels using one touch tuning



1 ONE TOUCH TUNING

Press OPEN to open the drop down panel.

Press ONE TOUCH TUNING on the VCR for more than 3 seconds. The VCR starts the channel presetting.



The WAIT indicator goes off when all receivable channels are preset.

To check to see if the channels are preset correctly

Set the TV to the video channel and press CHANNEL +/– on the VCR. If the TV screen changes to a different program each time you press CHANNEL +/–, the channels are preset correctly.

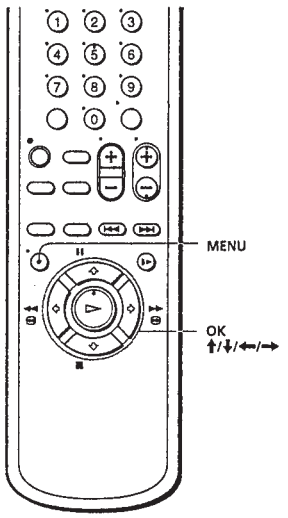
Tip

- To stop one touch tuning, press ONE TOUCH TUNING or ■ STOP on the VCR during the setting.

Presetting all receivable channels automatically

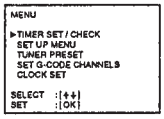
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



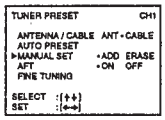
1 • MENU

Press MENU.



2

Press ↑/↓ to move the cursor (▶) to TUNER PRESET, then press OK.

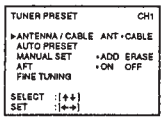


continued

Step 5: Presetting channels (continued)

3

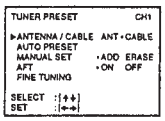
Press ↑/↓ to select ANTENNA/CABLE.



4

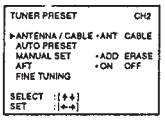
• To preset cable TV channels:

Press ←/→ to set ANTENNA/CABLE to CABLE.



• To preset VHF and UHF channels:

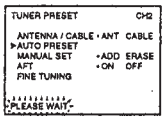
Press ←/→ to set ANTENNA/CABLE to ANT.



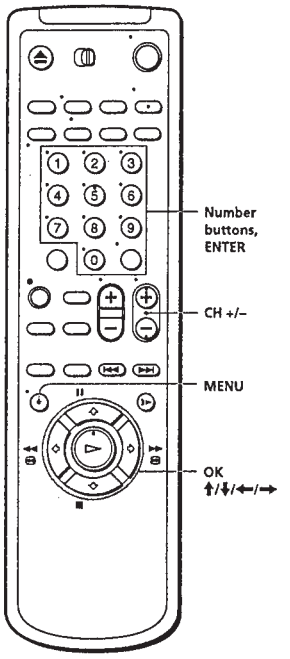
5

Press ↑/↓ to select AUTO PRESET, then press OK.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

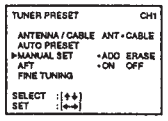


Presetting/disabling channels manually



1 • MENU

Press MENU and select TUNER PRESET, then press OK.



continued

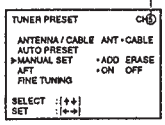
Step 5: Presetting channels (continued)

2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

- To preset a channel:

1 Press the number buttons to enter the channel number, then press ENTER.
2 Press ⬅/➡ to set MANUAL SET to ADD.

Channel to be preset

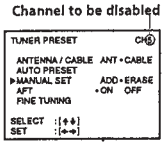


• CH

- To disable a channel:

1 Press CH +/– to select the channel number.
2 Press ⬅/➡ to set MANUAL SET to ERASE.

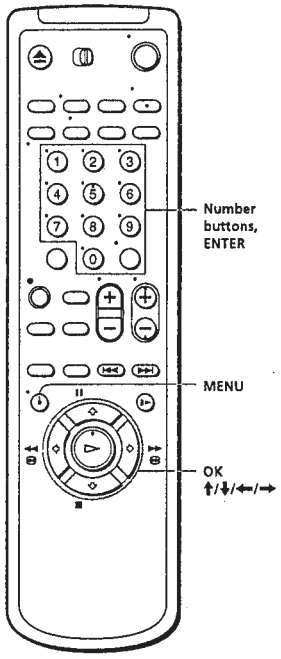
Channel to be disabled



3 Repeat step 2 to preset or disable channels as required, then press OK.

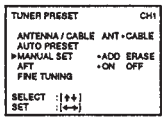
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



1 • MENU

Press MENU and select TUNER PRESET, then press OK.



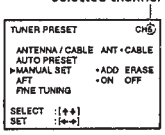
continued

Step 5: Presetting channels (continued)

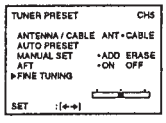
2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

Press the number buttons to select the channel you want to fine-tune, then press ENTER.

Selected channel

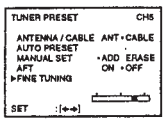


3 Press ↑/↓ to select FINE TUNING. The fine tuning meter appears.



4 Press ⬅/➡ to adjust to a clearer picture, then press OK.

Note that the AFT setting switches to OFF.



Tip

- To select the channel in step 2 above, you can also use the CH +/– buttons. In this case, you don't need to press ENTER.

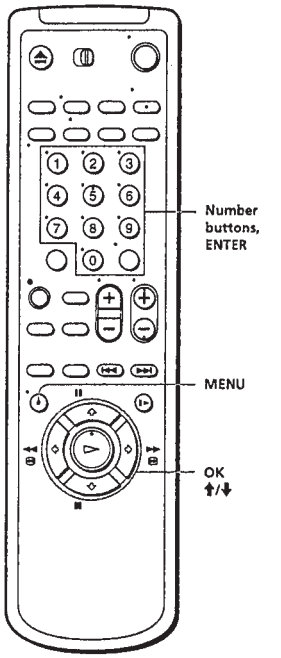
Step 6

Setting up G-CODE

G-CODE is a feature in Sony VCRs that simplifies programing the VCR to make timer recording. To use G-CODE, each TV channels needs to be matched with its G-CODE guide channel. To get the guide channel numbers, look in the program guide for your area that features G-CODE numbers.

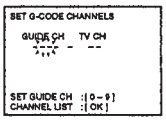
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



1 • MENU

Press MENU, then press ↑/↓ to move the cursor (▶) to SET G-CODE CHANNELS and press OK.

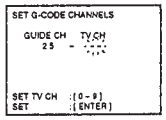


continued

Step 6: Setting up G-CODE (continued)

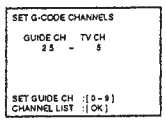
2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ ○

Enter the guide channel number assigned in the program guide and press ENTER.



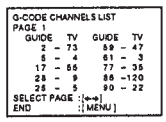
3 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ ○

Enter the actual number on your TV (and VCR) and press ENTER.



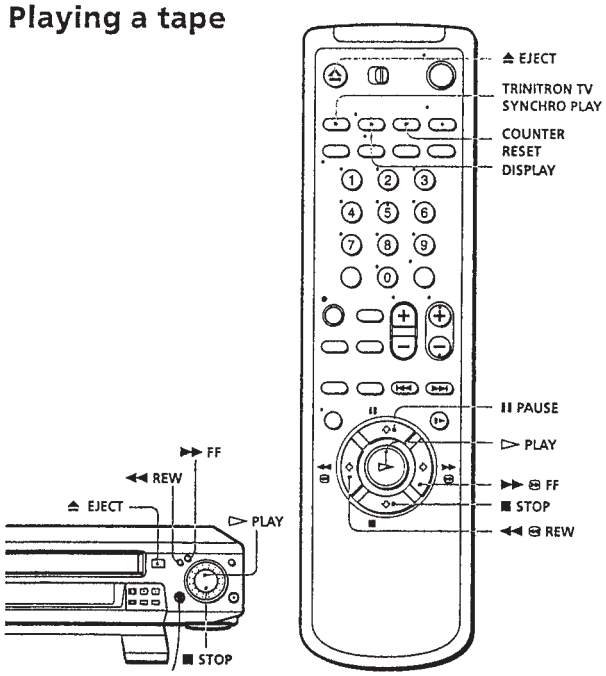
4 Repeat steps 2 and 3 for each channel whose numbers don't match.

5 When you have set all channels, press OK to confirm your channel settings.



6 • MENU ○ After all settings are complete, press MENU to exit.

Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

continued

Playing a tape (continued)

3 Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0:00:00". Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY.

Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use the ▷ PLAY, II PAUSE, ▶▶ FF, ◀◀ REW, or ■ STOP buttons.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

Turning on the VCR and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the VCR and TV with the audio/video cable (see "Audio/video (A/V) hookup" on page 7.) Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the VCR.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

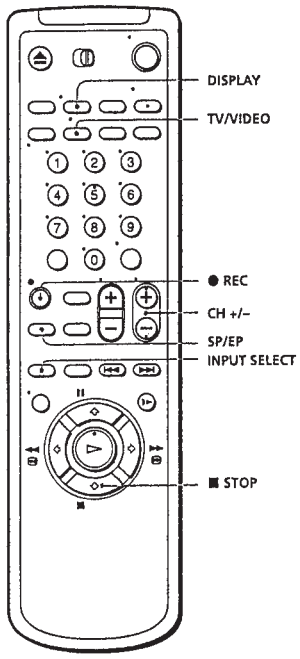
The VCR and TV turn on, and the TV is set to VCR reception. If there is a tape in the VCR, playback starts automatically.

Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY while playing back a video tape. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Recording TV programs



1 Turn on your TV and set it to the video channel.

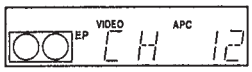
2 Insert a tape with its safety tab in place.

3 INPUT SELECT

Press INPUT SELECT until a channel number appears in the display window.

4 • CH

Press CH +/– to select the channel you want to record.



5 SP / EP

Press SP/EP to select the tape speed, SP or EP.

EP (Extra Play) provides recording time three times as long as SP (Standard Play), however, SP produces better picture and audio quality.

6 ● REC

Press ● REC to start recording.

The recording indicator lights up red in the display window.

Recording indicator

To stop recording

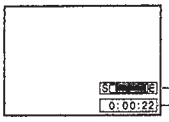
Press ■ STOP.

continued

Recording TV programs (continued)

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.

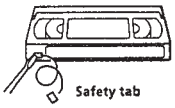


To watch another TV program while recording

1. Press TV/VIDEO to turn off the VIDEO indicator in the display window.
2. If the TV is connected to the VCR's LINE-1 OUT jacks, set the TV to TV input; if not, skip this step.
3. Select another channel on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



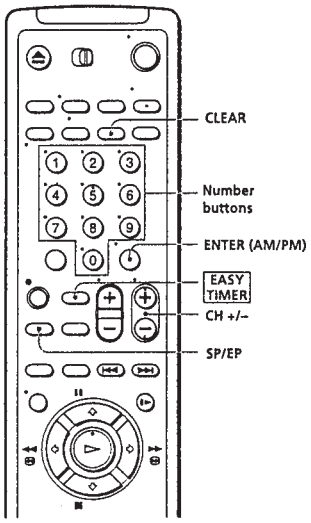
Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks using INPUT SELECT or CH +/– buttons.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

- The display doesn't appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.

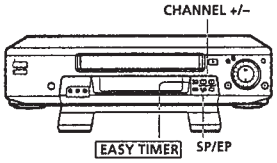
Recording TV programs using the easy timer



You can record one program on the same day (within 24 hours) using the easy timer. If the VCR clock has not been set due to power interruption, etc., you can set the clock and timer recording.

Before you start...

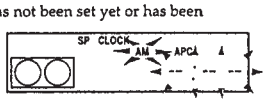
- Insert a tape with its safety tab in place. Make sure the tape is longer than the recording time.
- If you want to see the setting on the TV screen, turn on the TV and set it to the video channel.



1 EASY TIMER

Press EASY TIMER.

The CLOCK indicator appears and the current time flashes in the display window. If the clock has not been set yet or has been cleared, "–:– –" flashes.



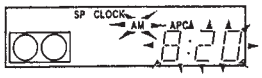
2 • CH

Set the current time, if necessary, using CH +/– or the number buttons. If the clock has already been set correctly, skip this step.

- Press CH +/– to increase or decrease the time by a minute. Holding down CH +/– changes the time by 15 minutes.

continued

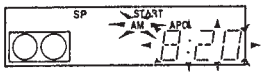
• Press the number buttons to enter hours and minutes. To set the clock to "8:20", for example, press 0, 8, 2 and 0 in sequence. Press ENTER (AM/PM) to change AM and PM.



3 EASY TIMER

Press EASY TIMER to confirm the clock setting.

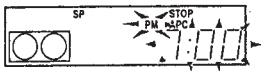
The START indicator appears.



4 • CH, EASY TIMER

Set the recording start time using CH +/– or the number buttons in the same way as in step 2, then press EASY TIMER.

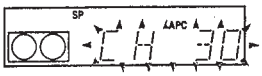
The STOP indicator appears.



5 • CH, EASY TIMER

Set the recording stop time in the same way as in step 2, then press EASY TIMER.

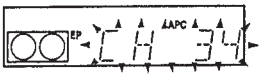
A channel number flashes.



6 • CH, SP/EP

Press CH +/– or the number buttons to select the channel you want to record.

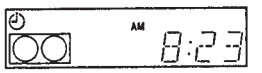
To select the tape speed, press SP/EP.



7 EASY TIMER

Press EASY TIMER to confirm the setting.

The ⏲ indicator appears in the display window and the VCR stands by for recording.



To stop recording

To stop the VCR while recording, press ■ STOP.

To check or change the timer setting

Press EASY TIMER repeatedly until the setting you want to check or change flashes. Then re-enter the new setting, if necessary. You can also change the timer setting using the TIMER SET/CHECK menu. For details, see page 39.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press POWER. The ⏲ indicator turns off and the VCR switches on. Remember to press POWER to reset the VCR in timer recording standby after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

Tips

- If you make a mistake when entering the time with the number buttons, complete entering the four digits, then re-enter the time. Then press EASY TIMER to confirm the setting.
- To record from a source connected to LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT or CH +/– to display "L1" or "L2" in the display window.
- To cancel the easy timer setting, press CLEAR on the remote commander or press CHANNEL + and – on the VCR at the same time during the setting. Note that the cancellation can only be done after clock setting mode.

Notes

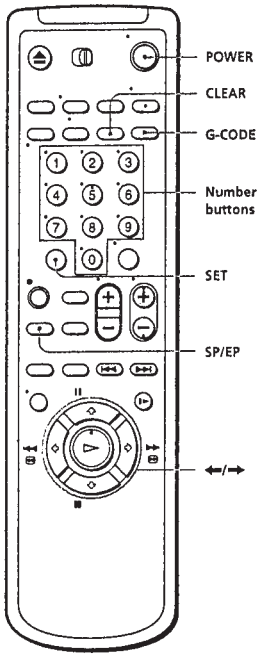
- You cannot set the easy timer if eight programs have already been set.
- You can set the timer for only one program using the easy timer. If you want to set the timer for other programs, use the TIMER SET/CHECK menu. For details, see page 39.
- You cannot set the date using the easy timer. Set the date using the CLOCK SET menu if you want to set the timer with the TIMER SET/CHECK menu. For details, see page 10.
- The ⏲ indicator flashes in the display window when you set the timer with no tape inserted.

Recording TV program using G-CODE

Just enter the program's G-CODE number listed in the TV program guide. The date, times and channel number of that program are set automatically. You can preset up to eight programs at a time.

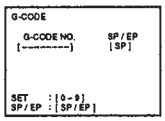
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 G-CODE

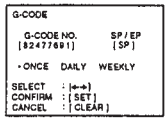
Press G-CODE.



2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

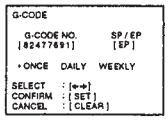
Press the number buttons to enter the program's G-CODE number.

If you make a mistake, press CLEAR and re-enter the correct number.



3 SP/EP

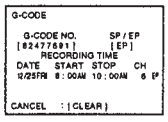
Press SP/EP to select SP or EP.



4 PLAY/G-CODE/OK

Select ONCE, DAILY or WEEKLY by using ←/→, then press SET:

To record	Select
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY



SET

The date, start and stop times, channel number, and tape speed appear on the TV screen.

If the information is not correct, press CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 • POWER

Press POWER to turn off the VCR.

The ⏲ indicator lights up in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

continued

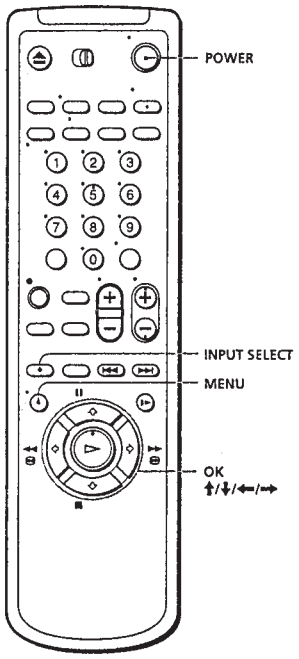
Tip
- To cancel the procedure, press G-CODE before pressing SET.

Note
- If the VCR beeps repeatedly, this means that:
  - The G-CODE number is incorrect.
  - ONCE, DAILY or WEEKLY was selected incorrectly. You cannot select DAILY or WEEKLY for a program that airs more than seven days ahead.

Setting the timer manually

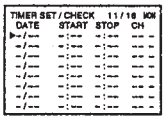
You can preset up to eight programs at a time.

Before you start...
- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



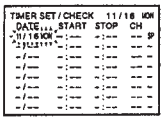
1 • MENU

Press MENU and select TIMER SET/CHECK, then press OK.



continued

2 Set the date, start and stop times, channel number and tape speed:



1 Press ➡ to flash each item in turn.
2 Press ↑/↓ to set each item.
To correct a setting, press ⬅ to return to that setting and reset.

To record the same program every day or the same day every week, press ↓ while the date is flashing. For details, see "Daily/weekly recording" on this page.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT or CH +/– to display "L1" or "L2" in the "CH" position.

3 Press ➡ to confirm the setting.

The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4 Press OK.

5 • POWER

Press POWER to turn off the VCR.

The ⏲ indicator lights up in the display window and the VCR stands by for recording.

Daily/weekly recording

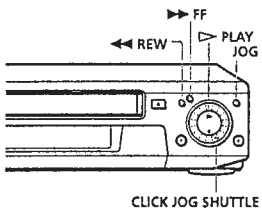
In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

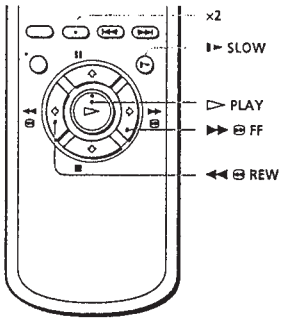
the current date → SUN-SAT → MON-SAT → MON-FRI → EVERY SAT → ..... → EVERY MON → EVERY SUN → 1 month later → (dates count down) → the current date

Tips
- To set the channel, you can also use the CH +/– or number buttons.
- To set the tape speed, you can also use SP/EP.

Note
- The ⏲ indicator flashes in the display window when you set the timer with no tape inserted.

Playing/searching at various speeds





Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ ⊖ FF down. During rewind, hold ◀◀ ⊖ REW down.
Play at high speed	• During playback, press ▶▶ ⊖ FF or ◀◀ ⊖ REW on the remote commander. • During playback, hold ▶▶ ⊖ FF or ◀◀ ⊖ REW down. When you release the button, normal playback resumes.
Play at twice the normal speed	During playback or pause, press ×2.
Play in slow motion	During playback or pause, press ▮▸ SLOW.
Play frame by frame	During pause, press ▶▶ ⊖ FF or ◀◀ ⊖ REW on the remote commander. Hold the button down to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding ◀◀ REW down on the VCR.

To resume normal playback

Press ▷ PLAY.

continued

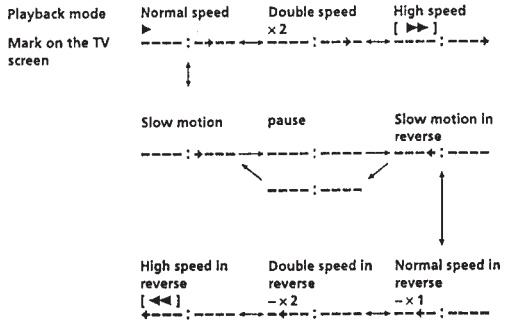
Using the CLICK JOG SHUTTLE ring on the VCR

With the CLICK JOG SHUTTLE ring, you can operate a variety of playback options.

There are two ways to use the CLICK JOG SHUTTLE ring: normal mode (CLICK SHUTTLE ring) and jog mode (CLICK JOG ring).

To use the CLICK SHUTTLE ring in normal mode

During playback or pause, turn the CLICK SHUTTLE ring clockwise or counterclockwise. Each change in the CLICK SHUTTLE ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on.



To use the CLICK JOG ring in jog mode

Use this mode for frame-by-frame playback.
Press JOG to enter the jog mode. The JOG button/indicator lights up. If you change to jog mode during any playback mode, playback pauses so you can see a still picture. Each change in the CLICK JOG ring position shifts the picture one frame. To shift frames in the reverse, turn the CLICK JOG ring counterclockwise.
The frame shift speed depends on the speed you turn the CLICK JOG ring.
To resume normal playback, press JOG again. The JOG indicator goes off. Then press ▷ PLAY.

Tip

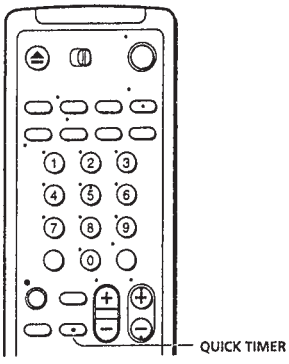
- Adjust the picture using the TRACKING +/− buttons on the VCR if:
  - Streaks appear while playing in slow motion.
  - The picture shakes while pausing.

  To set tracking to the center position, press both buttons (+/−) at the same time.

Notes

- The sound is muted during these operations.
- In EP mode, noise may appear or there may be no color.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have snow when playing at high speed in reverse.
- On screen symbols may shake while playing or searching at various speeds.

Recording TV programs using the quick timer



After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.

1 While recording, press QUICK TIMER once.

The ⏲ indicator appears in the display window.

2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

0:00 → 0:30 → 1:00 ····→ 10:30 → 11:00

The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

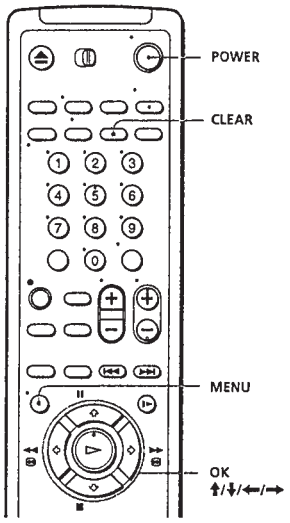
To stop the VCR while recording

Press ■ STOP.

Using the quick timer during stop mode

You can set the quick timer and start recording during stop mode by pressing QUICK TIMER. To set the channel, you can use the CH +/− or INPUT SELECT buttons. Press QUICK TIMER repeatedly to set the recording duration. The recording will start automatically.

Checking/ changing/ canceling timer settings

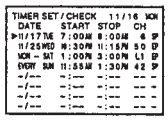


Before you start...

- Turn on your TV and set it to the video channel.

1 Press POWER to turn on the VCR.

2 Press MENU and select TIMER SET/CHECK:


TIMER SET/CHECK 11/16 MON
DATE START STOP CH
▶11/17 TUE 7:00AM 8:00AM 6 EP
11/25 WED 10:30AM 11:15AM SO EP
MON-SAT 1:00PM 3:00PM L1 EP
EVERY SUN 11:05AM 1:30PM 42 EP
-/-- --:-- --:-- -- -
-/-- --:-- --:-- -- -
-/-- --:-- --:-- -- -
-/-- --:-- --:-- -- -

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press OK, then turn off the VCR to return to recording standby.

3 Press ↑/↓ to select the setting you want to change or cancel:

- To change the setting, press ←/→ to flash the item you want to change, and press ↑/↓ to reset it. Then, press → repeatedly until the cursor (▶) appears at the beginning of the line.
- To cancel the setting, press CLEAR.

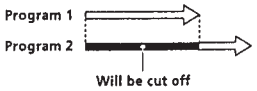
4 Press OK.

If any timer settings remain, turn off the VCR to return to recording standby.

continued

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



Recording stereo and bilingual programs

This VCR automatically receives and records stereo and bilingual programs. When a stereo or bilingual program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the SET UP MENU to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 44.

To select bilingual sound while recording

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO

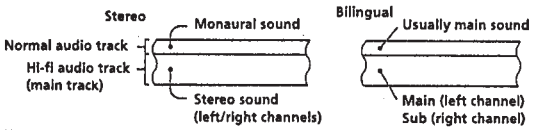
Selecting the sound while playing

Press AUDIO MONITOR to select the desired sound. (The sound being recorded will not change.)

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	L CH	STEREO
Right channel/sub	R CH	STEREO
Standard sound on the normal audio track	No indicator	No indicator

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

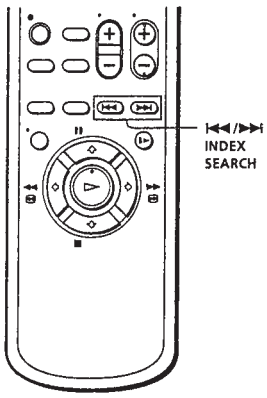


Notes

- To listen to the playback sounds in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF. For details, see page 44.

Searching using the index function

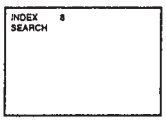
The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.



1 Insert an indexed tape into the VCR.

2 Press ⏮/⏭ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ⏭ INDEX SEARCH.
- To search backwards, press ⏮ INDEX SEARCH.



The VCR starts searching and the index number on the TV screen counts down to zero. The playback starts from the point about five seconds ahead of the specified index mark.

To stop searching

Press ■ STOP.

Note

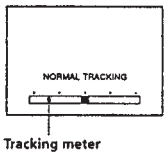
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ▨ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING +/– buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ▨ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (with the APC indicator in the display window lit).

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and start recording at the first time, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC

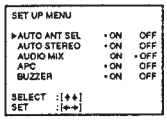
Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window goes off.

Notes

- The auto tracking adjustment cannot be guaranteed to work with tapes recorded in the LP mode on other VCRs.
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyze the tape. After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is canceled.

Changing menu options

1 Press MENU and select SET UP MENU.



2 Press ↑/↓ to select the option to change, then press ←/→ to change the setting.

3 Press OK to return to the original screen.

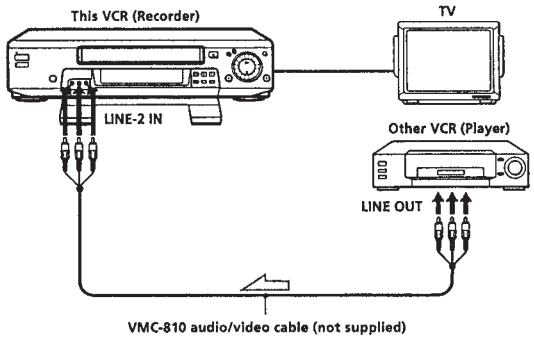
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUTO ANT SEL	**ON** if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4). **OFF** if your TV is connected to both VHF/UHF OUT and LINE-1 OUT on the VCR. To play a tape, set the TV to the VCR input.
AUTO STEREO	**ON** to receive stereo programs. OFF to reduce noise; the sound changes to monaural.
AUDIO MIX	ON to listen to the sound recorded on hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. OFF to switch off APC.
BUZZER	**ON** to output a beep sound when all illogical operation is made. OFF to deactivate it.

Hooking up to a VCR or stereo system

How to hook up to record on this VCR



: Signal flow

How to hook up to a stereo system

Connect LINE-1 IN or LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

Tips

- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- You can also use the LINE-1 IN jacks instead. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910MS audio/video cable (not supplied).

Notes

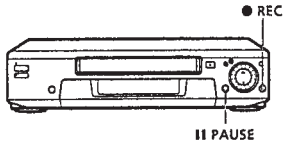
- Make sure you connect the plugs to jacks of the same color.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

Basic editing

(when recording on this VCR)

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or CH +/– to display "L1" or "L2" in the display window.
- Press SP/EP to select the tape speed, SP or EP.



1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC and set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

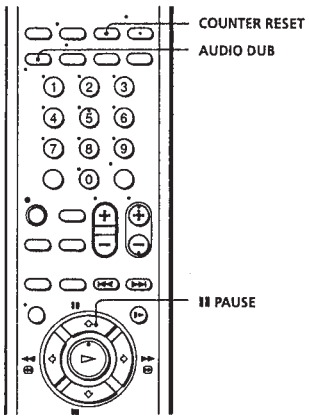
- To edit more precisely, press the II PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording.

Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press II PAUSE immediately after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is canceled.

Audio dubbing

This feature lets you record over the normal audio track. The monaural sound previously recorded is replaced while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.



Before you start dubbing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or CH +/– to display "L1" or "L2" in the display window.

1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.

2 Insert a prerecorded tape into this (recording) VCR. Search for the end of the section to be replaced and press II PAUSE.

Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET on this VCR to reset the counter to "0:00:00."

4 Rewind the prerecorded tape to the beginning of the section to be replaced.

The VCR pauses.

5 Press AUDIO DUB.

The ⊖ indicator appears in the display window.

6 To start editing, press the II PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

When the counter reaches "0:00:00", audio dubbing stops automatically.

To stop while editing

Press the ■ STOP buttons on this VCR and the stereo system (or other VCR).

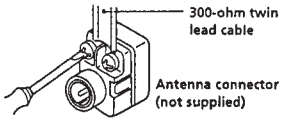
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the SET UP MENU (page 44). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

General setup information

Attaching the external antenna connector

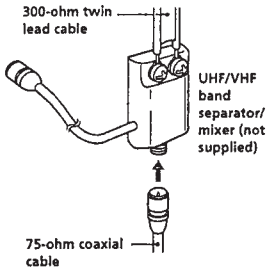
When using a 300-ohm twin lead cable for VHF/UHF antenna, use an antenna connector (not supplied) to connect the antenna to the VCR.



1 Loosen the screws on the antenna connector.
2 Wind the twin leads around the screws on the antenna connector.
3 Retighten the screws.

Attaching a UHF/VHF band mixer

When using both 75-ohm coaxial cable and 300-ohm twin lead cable for VHF/UHF antenna, use a UHF/VHF band separator/mixer (not supplied) to connect the antenna to the VCR.

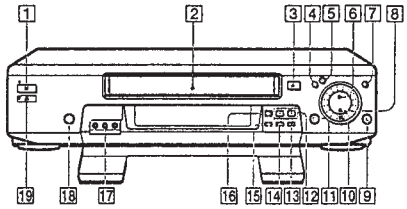


1 Loosen the screws on the mixer.
2 Wind the twin leads around the screws on the mixer.
3 Retighten the screws.
4 Connect the 75-ohm coaxial cable to the mixer.

Index to parts and controls

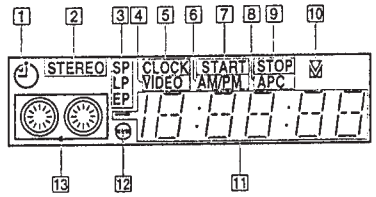
Refer to the pages indicated in parentheses ( ) for details.

Front panel



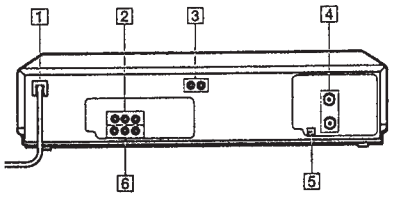
1 POWER switch/indicator (34)
2 Tape compartment
3 ⏏ EJECT button (22)
4 ◀◀ REW (rewind) button (22, 35)
5 ▶▶ FF (fast-forward) button (22, 35)
6 ▷ PLAY button (22)
7 JOG button/indicator (36)
8 ■ STOP button (22)
9 ● REC (record) button (25)
10 CLICK JOG SHUTTLE ring (36)
11 ❚❚ PAUSE button (22)
12 CHANNEL/TRACKING +/– buttons (12, 43)
13 INPUT SELECT button (25, 34)
14 SP (Standard Play)/EP (Extra Play) button (25)
15 ONE TOUCH TUNING button (12)
16 EASY TIMER button (27)
17 LINE-2 IN VIDEO/AUDIO L/R jacks (45)
18 OPEN button (12)
19 Remote sensor (5)

Display window



1 Timer indicator (28)
2 STEREO indicator (41)
3 Tape speed indicator (25)
4 VIDEO indicator (9, 26)
5 CLOCK indicator (27)
6 AM/PM indicator (28)
7 START indicator (28)
8 APC (Adaptive Picture Control) indicator (43)
9 STOP indicator (28)
10 Tracking indicator (43)
11 Time counter/clock/line/channel indicator (22, 25, 28, 46)
12 Audio dubbing indicator (47)
13 Tape/recording indicator (25)

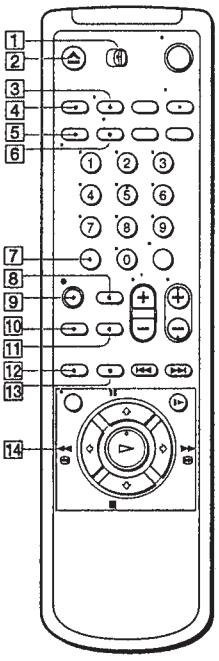
Rear panel



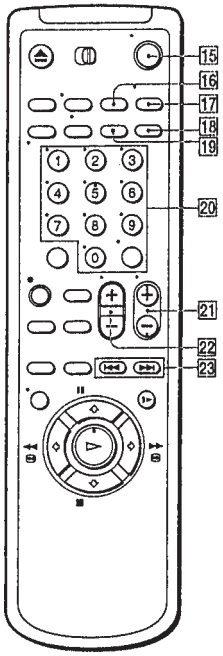
1 AC power cord
2 LINE-1 IN AUDIO R/L/VIDEO jacks (45)
3 LINE-2 OUT (AUDIO) jacks (7)
4 VHF/UHF IN/OUT connectors (8)
5 RF (Radio Frequency) UNIT switch (9)
6 LINE-1 OUT AUDIO R/L/VIDEO jacks (7)

continued

Remote commander



1 TV/VIDEO remote control switch (5)
2 ⏏ EJECT button (22)
3 DISPLAY button (26)
4 TRINITRON TV SYNCHRO PLAY button (23)
5 AUDIO DUB (dubbing) button (47)
WIDE button (5)
6 TV/VIDEO button (9)
7 SET button (31)
8 EASY TIMER button (27)
9 ● REC (record) button (25)
10 SP (Standard Play)/EP (Extra Play) button (25)
11 QUICK TIMER button (38)
12 INPUT SELECT button (25, 34)
13 ×2 button (35)
14 Tape/menu operation buttons
MENU button (10, 44)
❚❚ PAUSE/↑ button (22)
■ STOP/↓ button (22)
◀◀ REW (rewind)/← button (22, 35)
▶▶ FF (fast-forward)/ → button (22, 35)
▷ PLAY/OK button (22)
❚▶ SLOW button (35)



15 POWER switch (34)

16 COUNTER RESET button (22)

17 AUDIO MONITOR button (41)

18 G-CODE button (30)

19 CLEAR button (39)

20 Number buttons and ENTER (AM/PM) button (16)

21 CH (channel) +/– buttons (25)

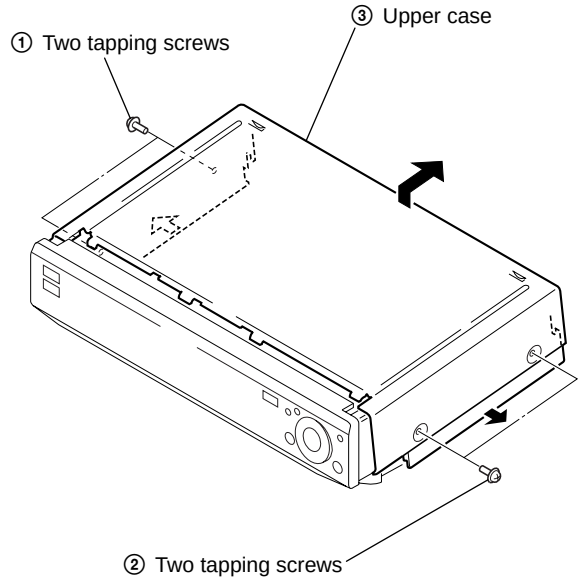
22 VOL (volume) +/– buttons *(for TV)*

23 ⏮/⏭ INDEX SEARCH buttons (42)

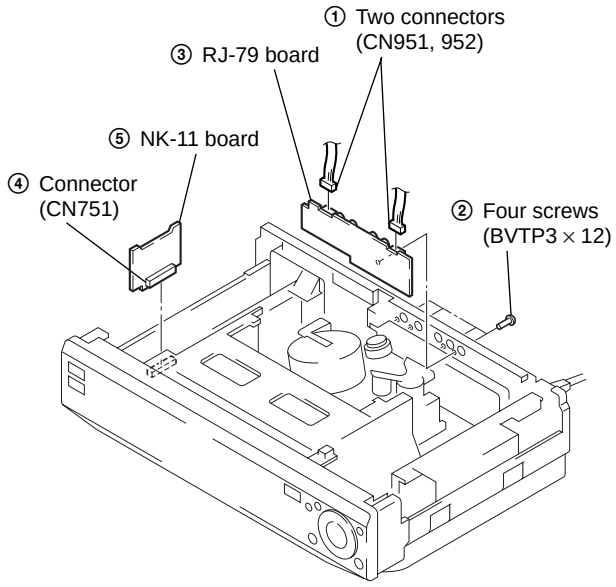
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

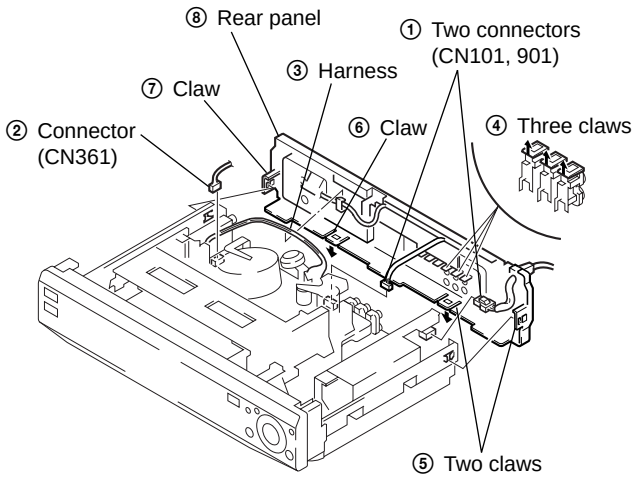
2-1. UPPER CASE REMOVAL



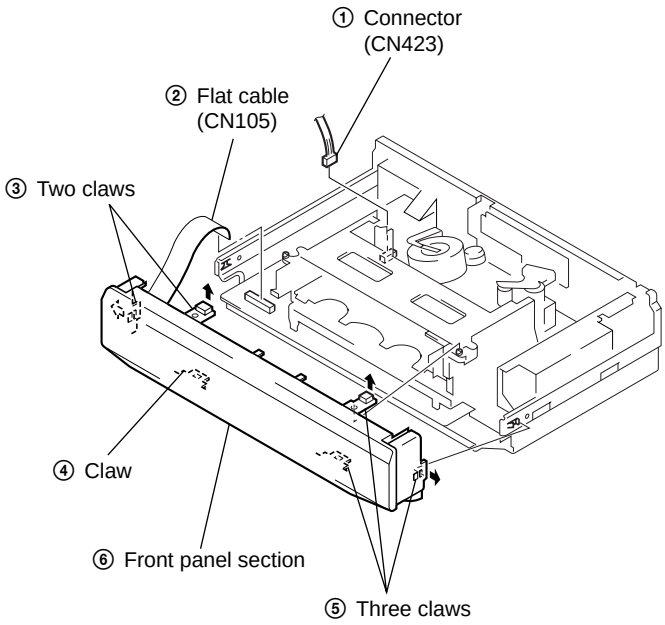
2-2. RJ-79, NK-11 BOARD REMOVAL



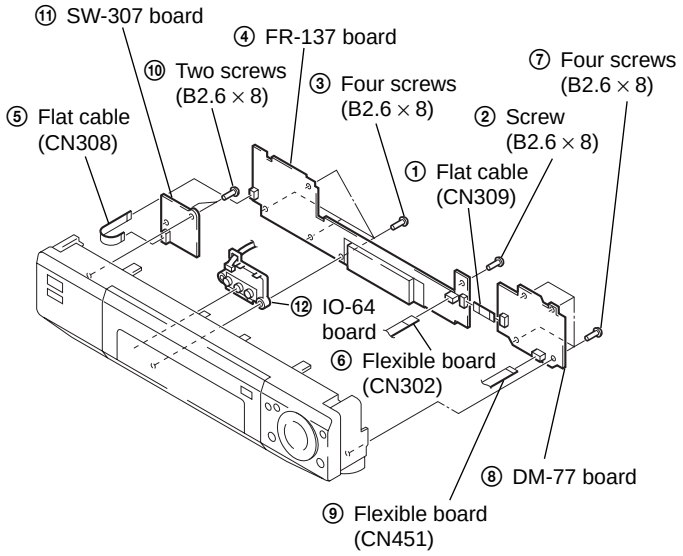
2-3. REAR PANEL REMOVAL



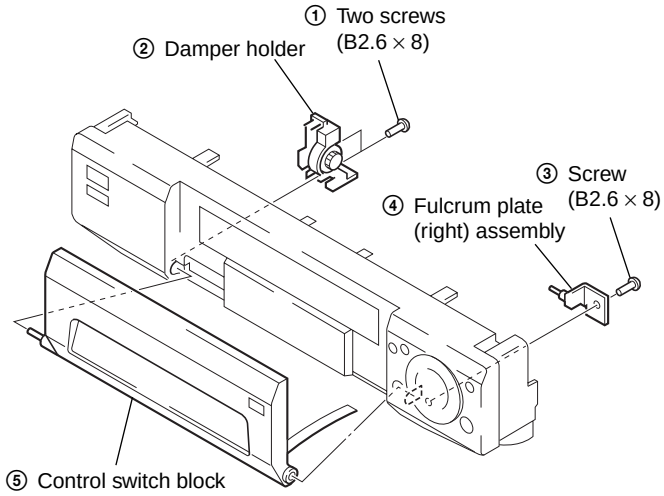
2-4. FRONT PANEL SECTION REMOVAL



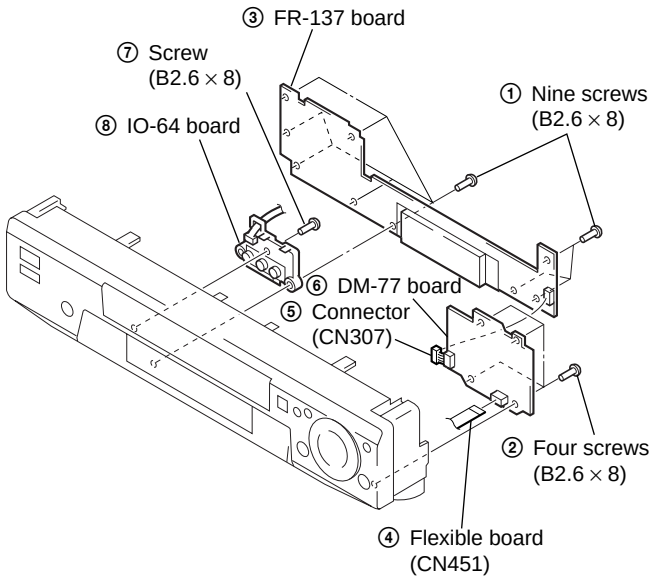
2-5. FR-137, DM-77, SW-307, IO-64 BOARD REMOVAL (ED9)


⑪ SW-307 board
④ FR-137 board
⑩ Two screws (B2.6 × 8)
③ Four screws (B2.6 × 8)
⑦ Four screws (B2.6 × 8)
⑤ Flat cable (CN308)
② Screw (B2.6 × 8)
① Flat cable (CN309)
⑫ IO-64 board
⑥ Flexible board (CN302)
⑧ DM-77 board
⑨ Flexible board (CN451)

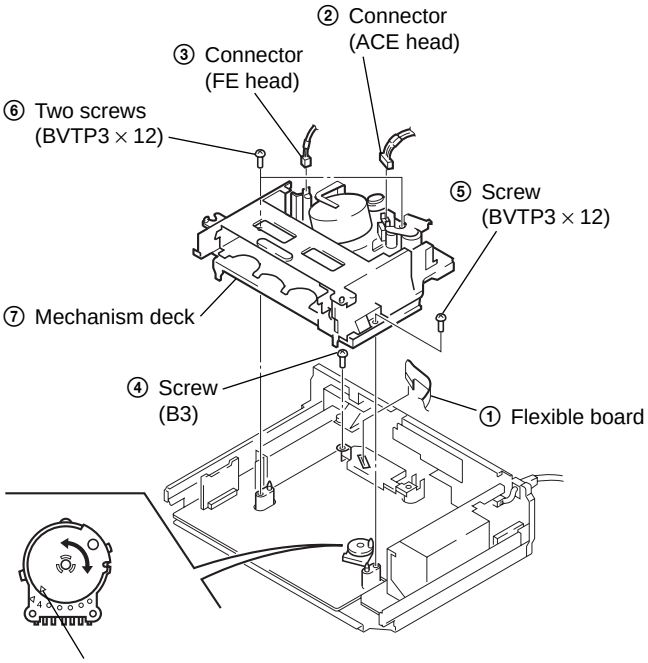
2-6. CONTROL SWITCH BLOCK REMOVAL (ED9)



2-7. FR-137, DM-77, IO-64 BOARD REMOVAL (ED8)

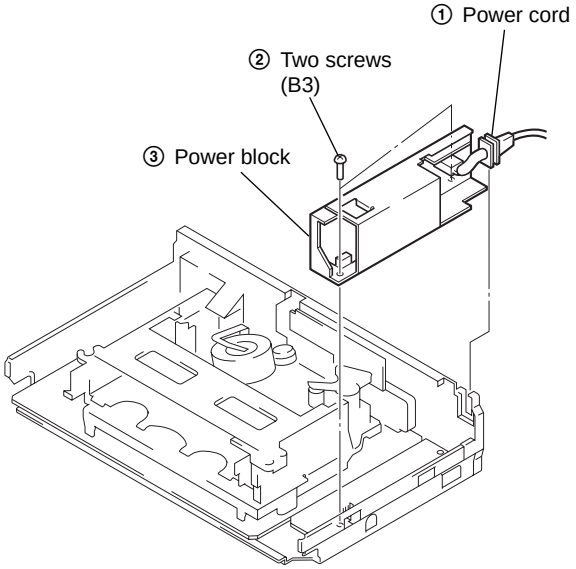

③ FR-137 board
⑦ Screw (B2.6 × 8)
① Nine screws (B2.6 × 8)
⑧ IO-64 board
⑥ DM-77 board
⑤ Connector (CN307)
② Four screws (B2.6 × 8)
④ Flexible board (CN451)

2-8. MECHANISM DECK REMOVAL

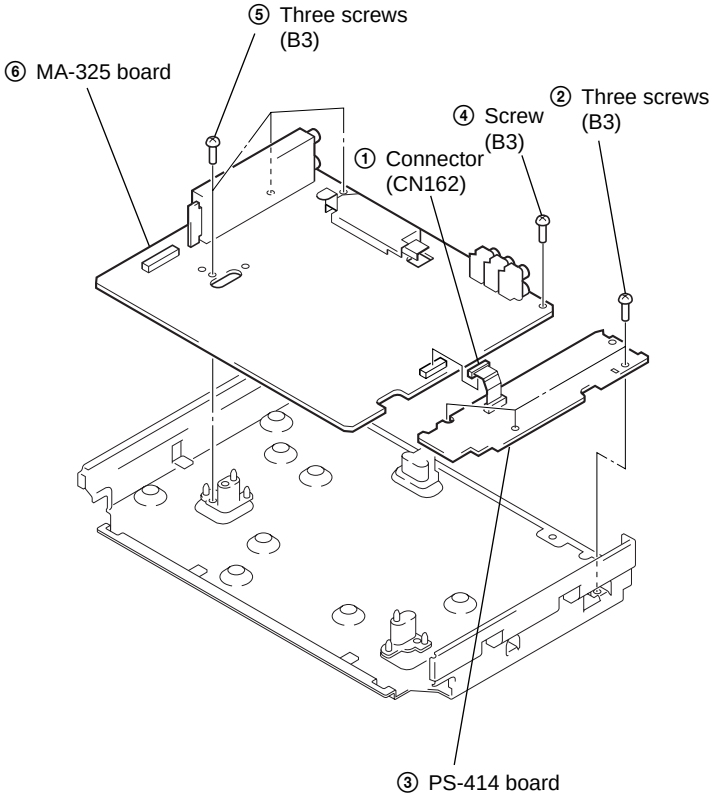


Note: When mounting the mechanism deck, first align △ mark on the rotary switch.

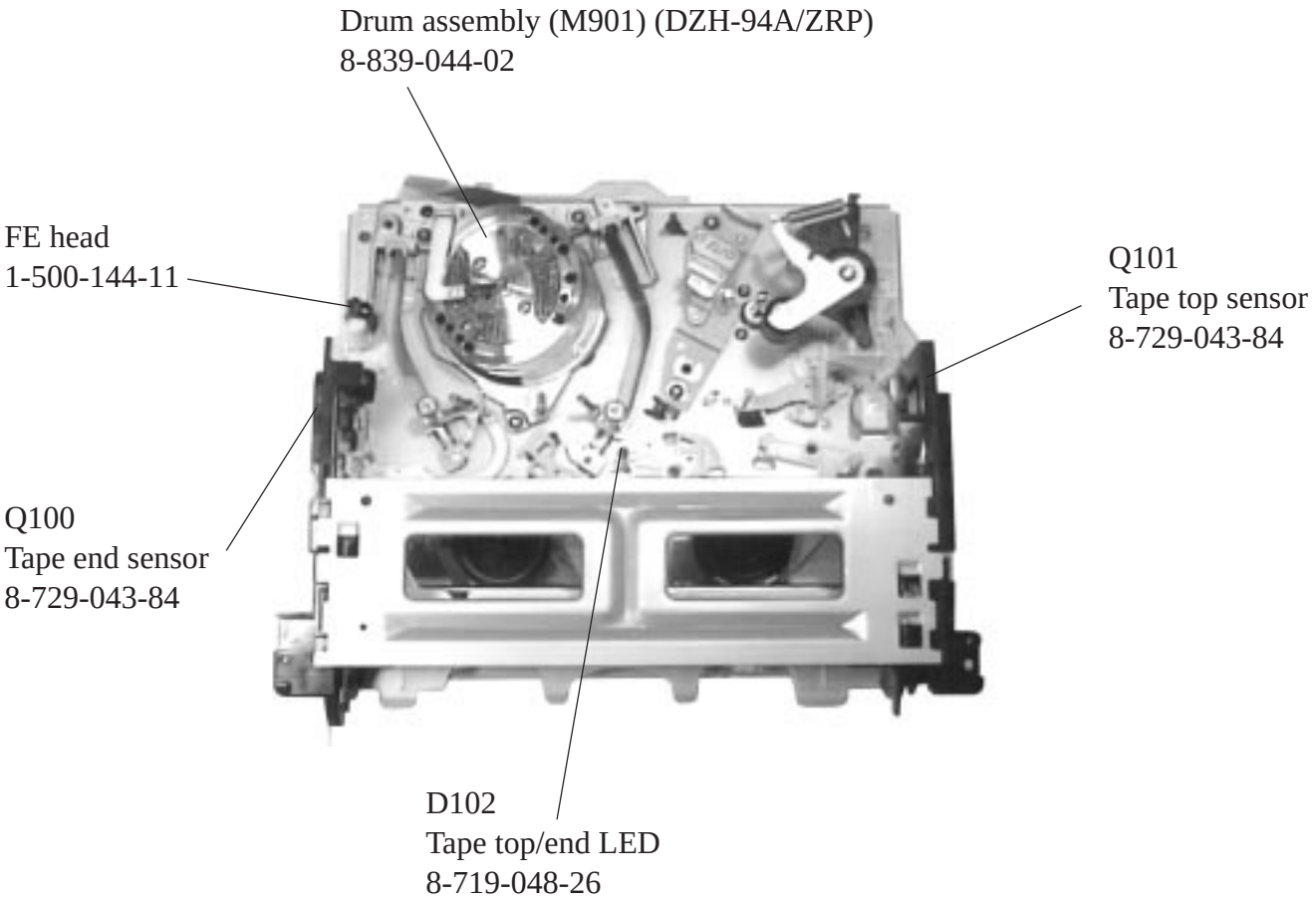
2-9. POWER BLOCK REMOVAL

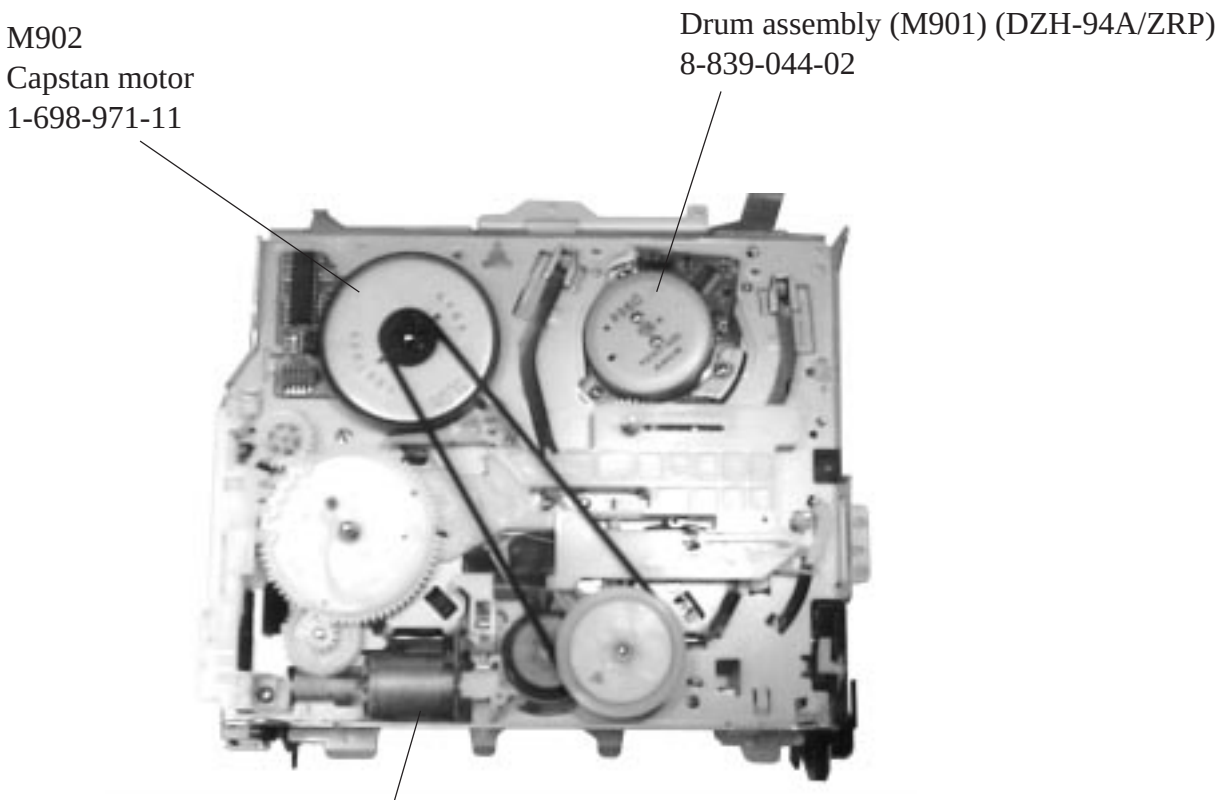


2-10. PS-414, MA-325 BOARD REMOVAL

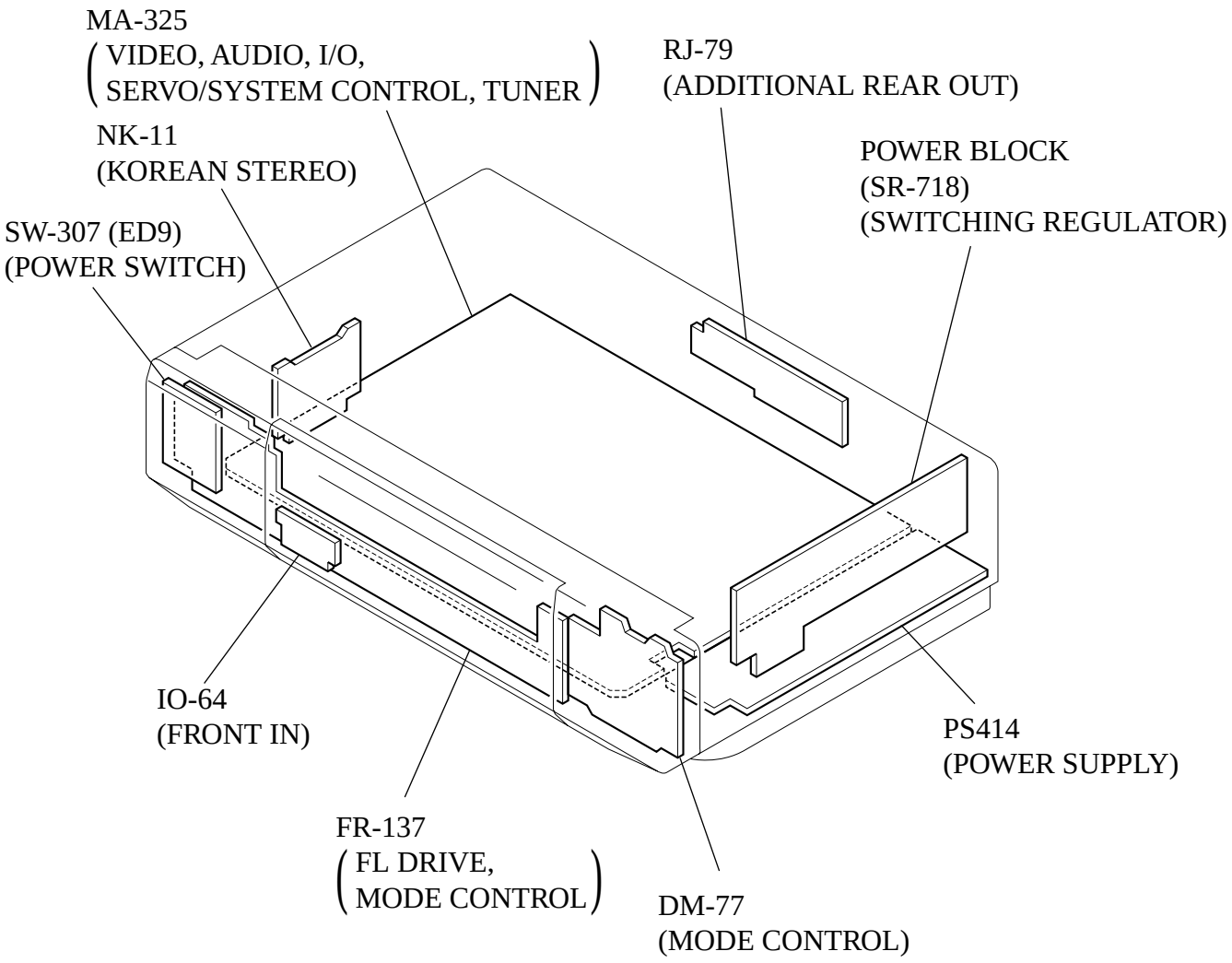


2-11. INTERNAL VIEWS



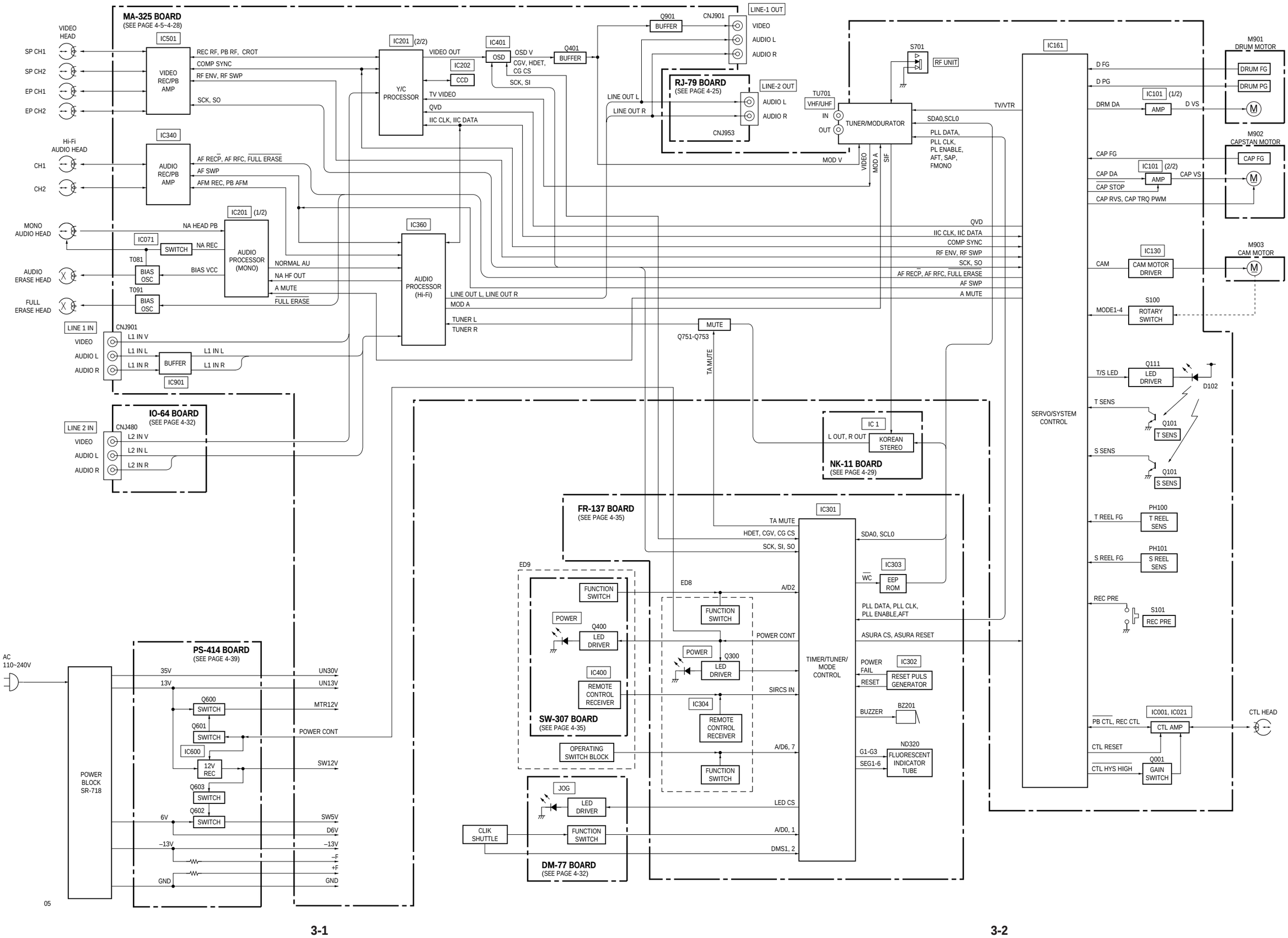


2-12. CIRCUIT BOARDS LOCATION



SECTION 3
BLOCK DIAGRAMS

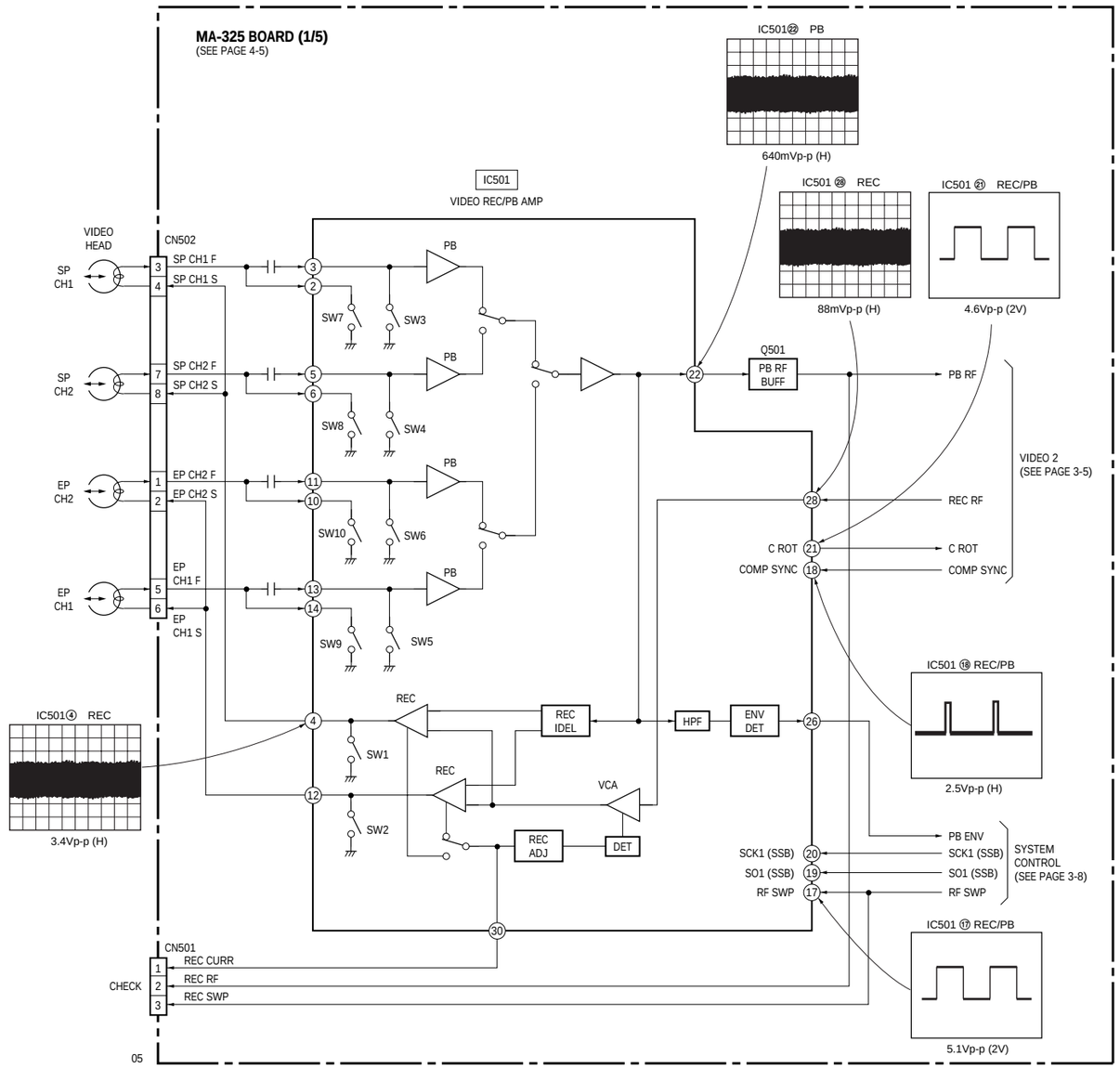
3-1. OVERALL BLOCK DIAGRAM



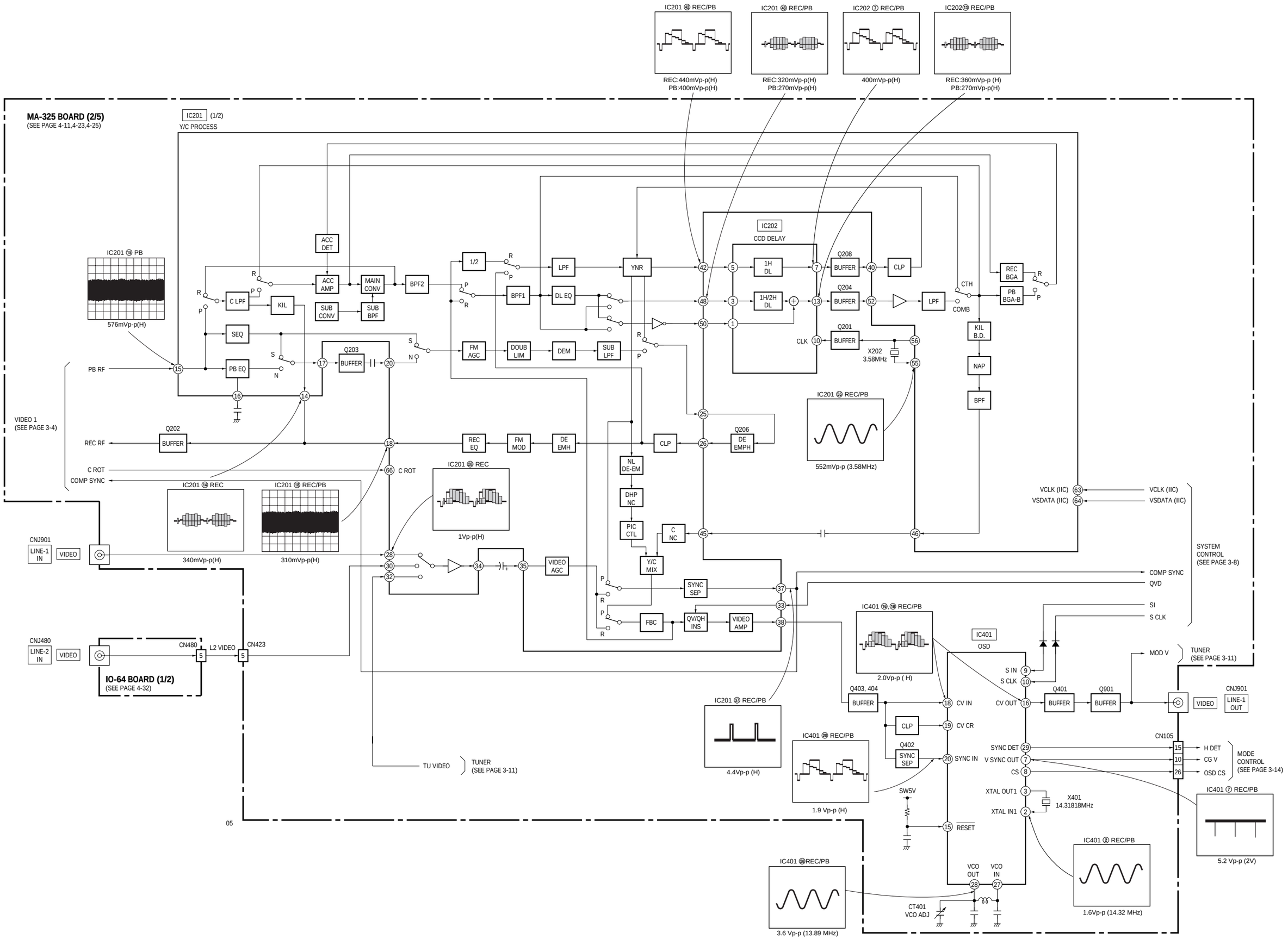
3-1

3-2

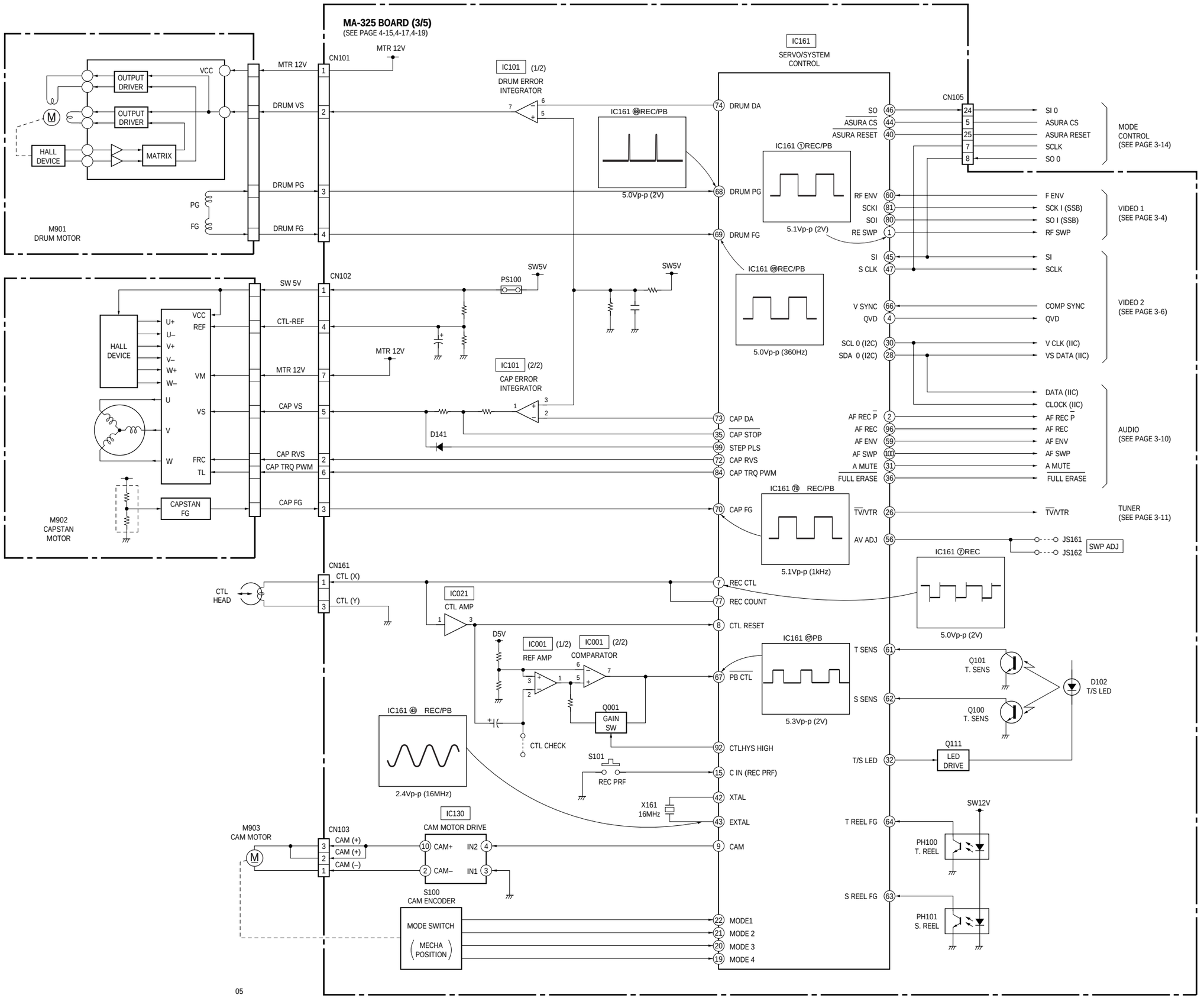
3-2. VIDEO1 BLOCK DIAGRAM



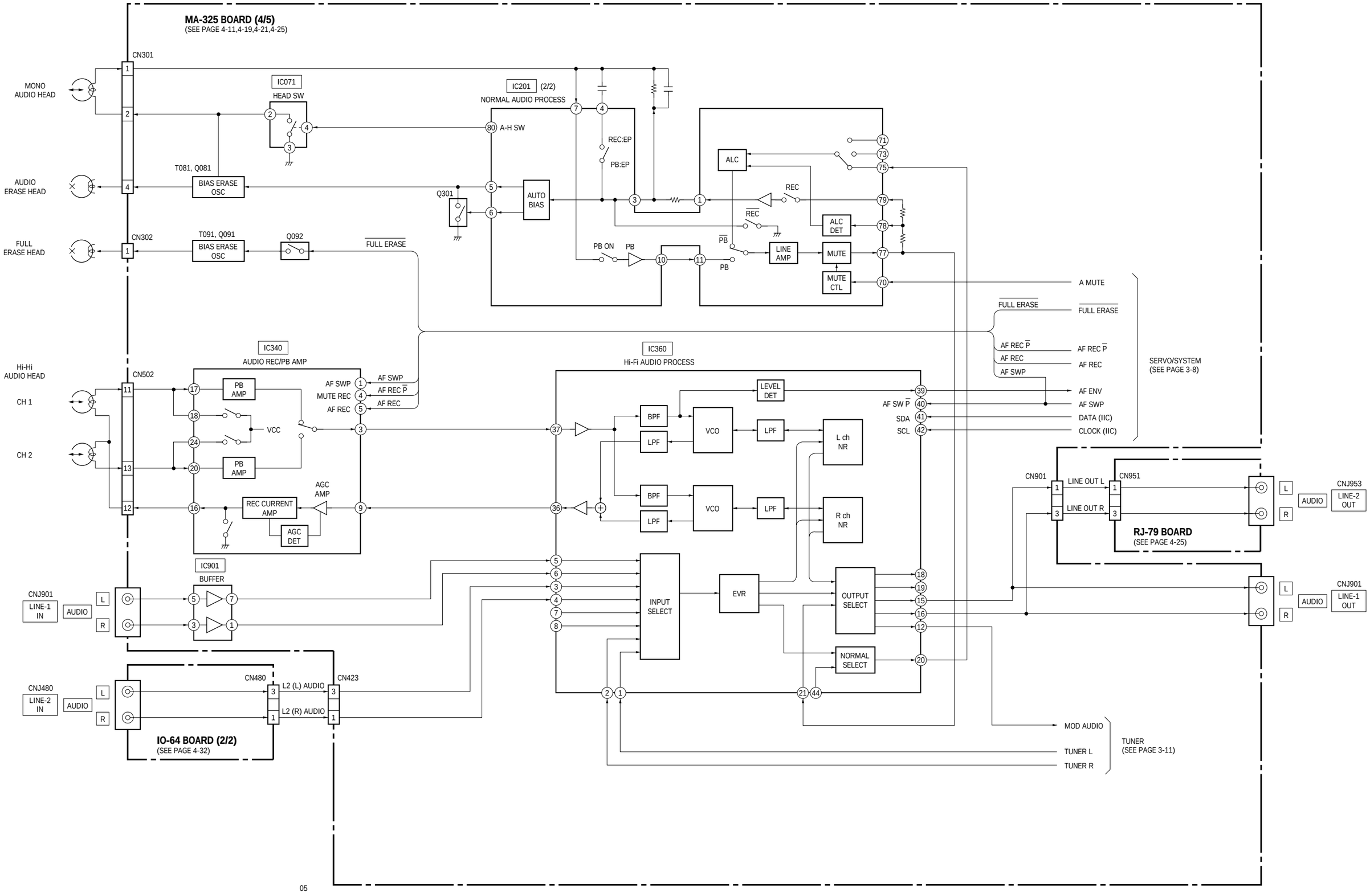
3-3. VIDEO2 BLOCK DIAGRAM



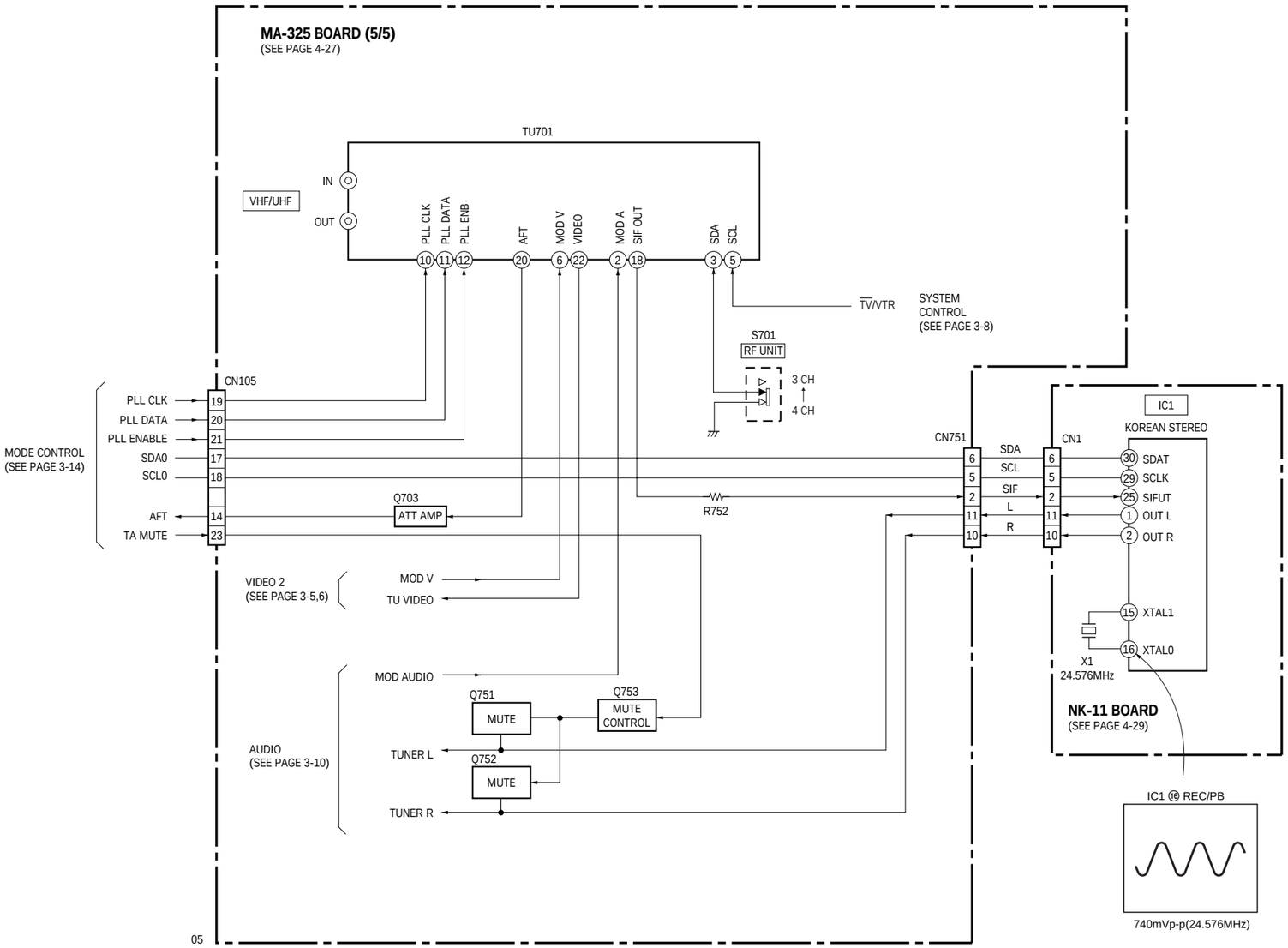
3-4. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



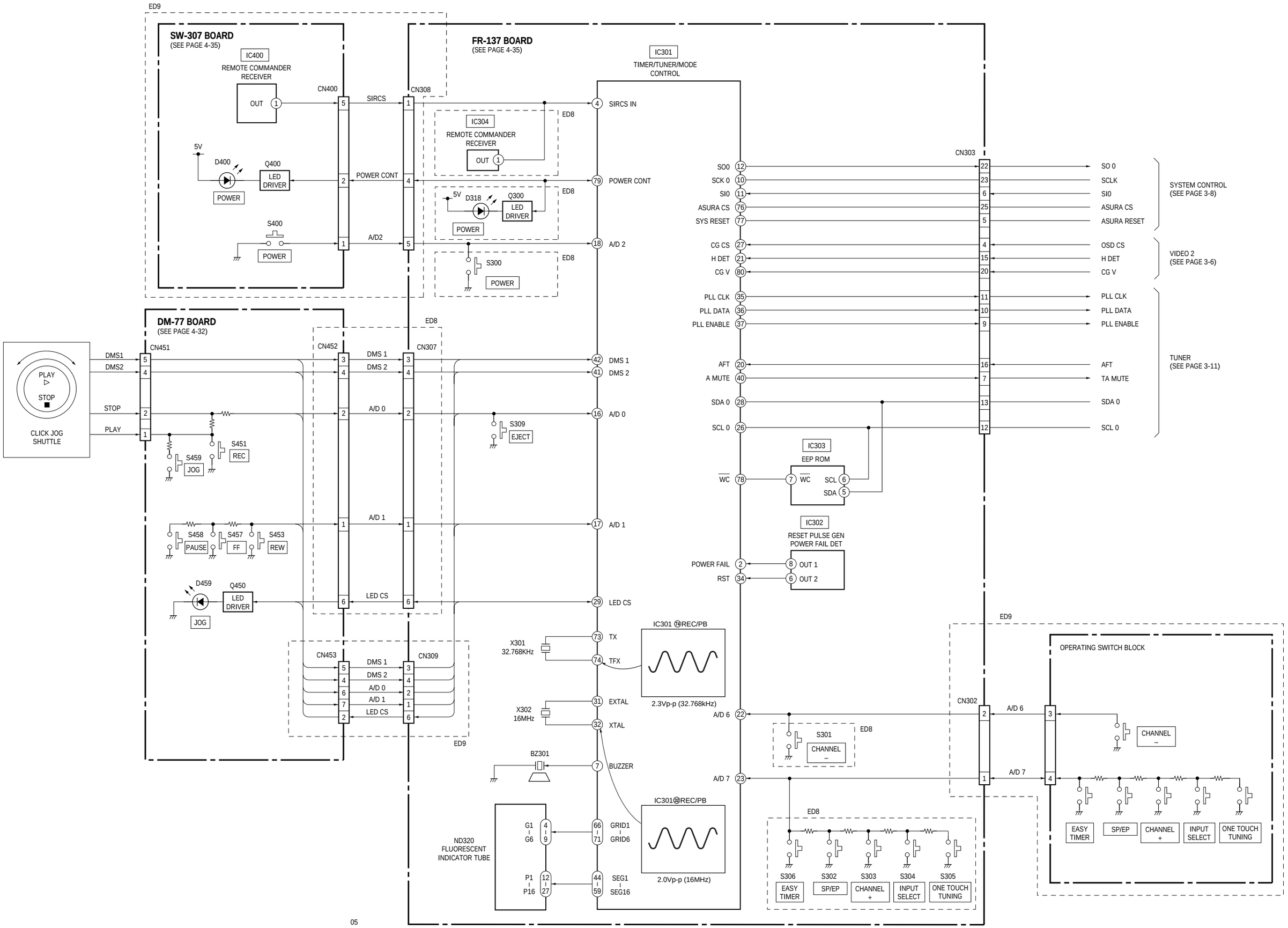
3-5. AUDIO BLOCK DIAGRAM



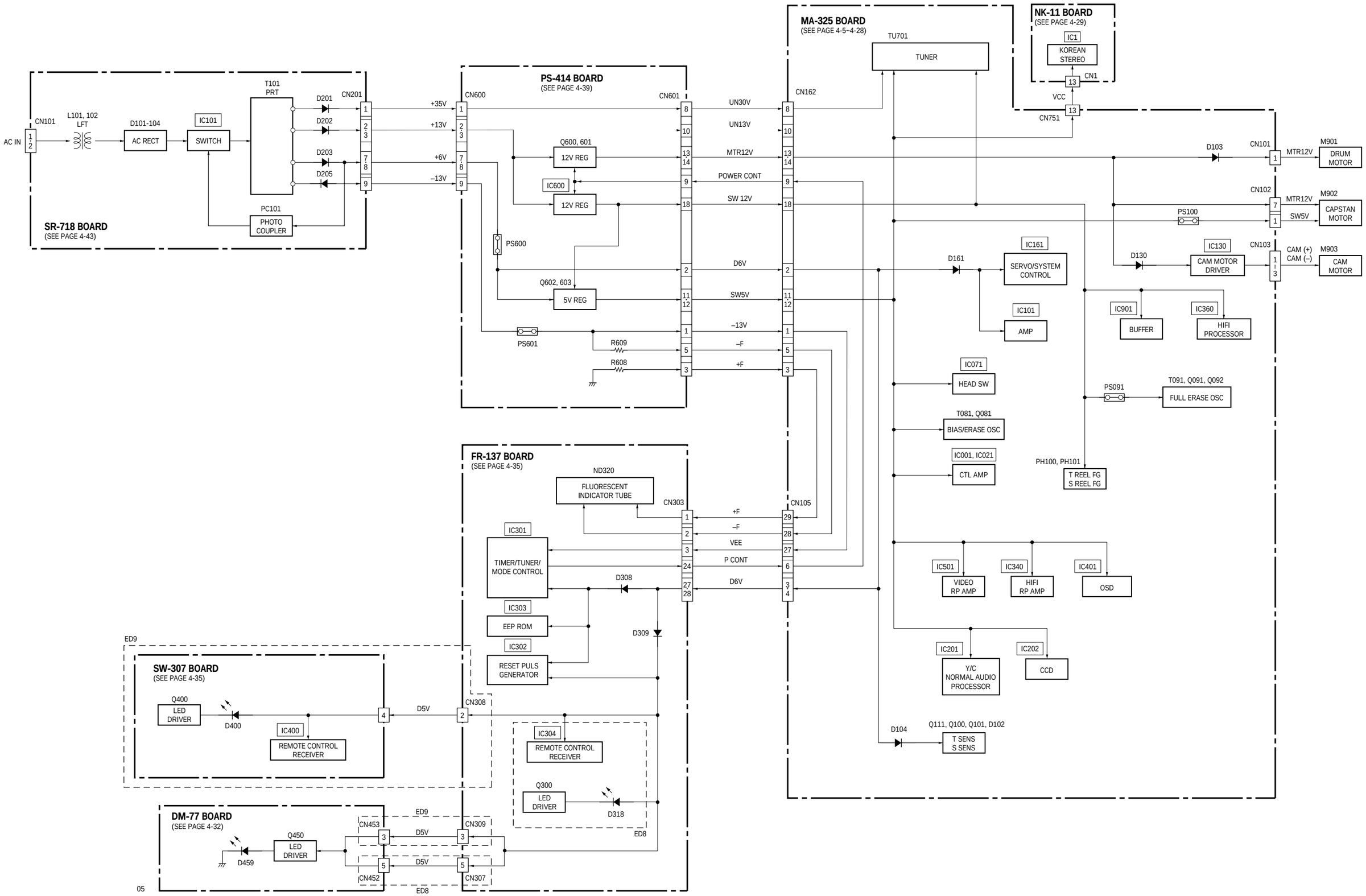
3-6. TUNER BLOCK DIAGRAM



3-7. MODE CONTROL BLOCK DIAGRAM



3-8. POWER BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary mote is printed in each block.)

For printed wiring boards:

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

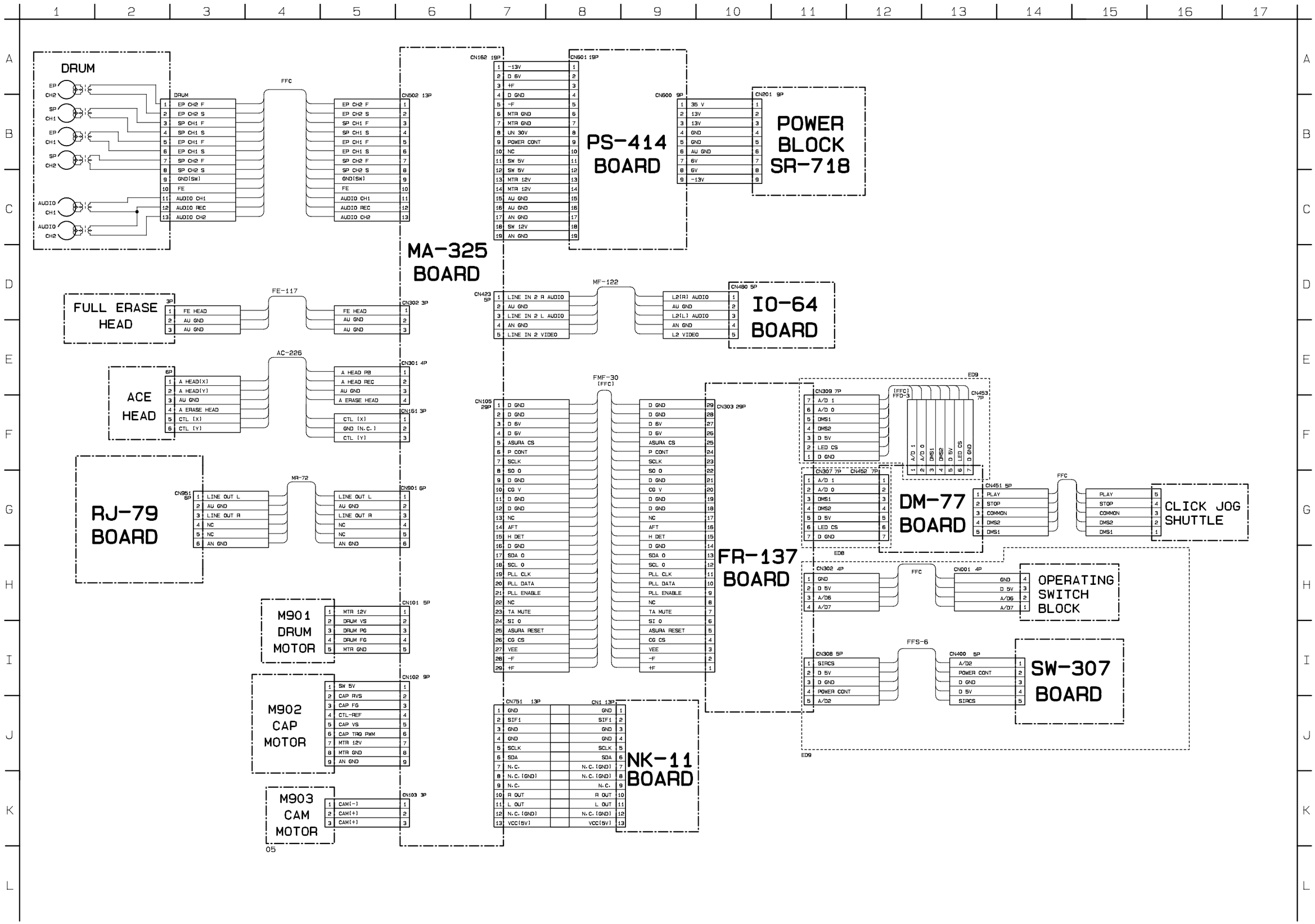
For schematic Diagram:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, $^1/_4$ W (Chip resistors : $^1/_{10}$ W) unless otherwise specified.
  kΩ : 1000Ω, MW : 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- B + : B+ Line.
- B − : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

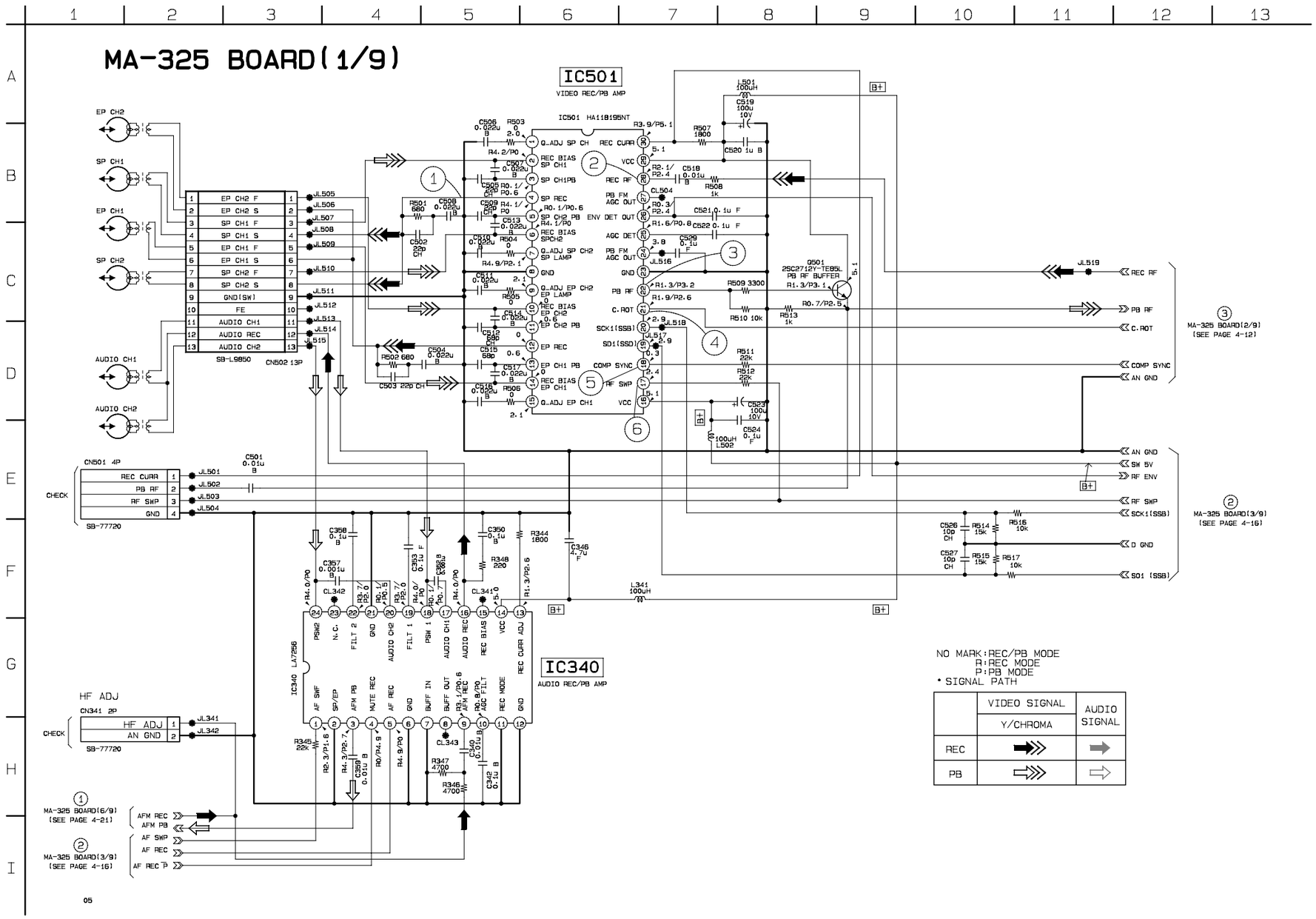
4-1. FRAME SCHEMATIC DIAGRAM



4-2. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAMS

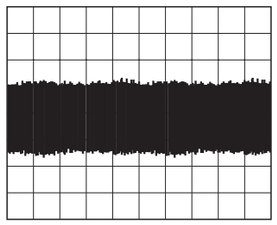
MA-325 (HEAD AMP) SCHEMATIC DIAGRAM • See page 4-9 to 4-10 for printed wiring board.

– Ref. No.: MA-325 board; 2,000 series –



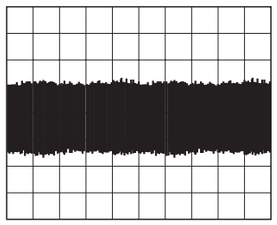
• Waveforms

❶ IC501 ④ REC



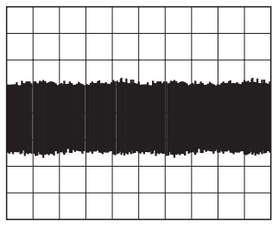
3.4 Vp-p (H)

❷ IC501 ㉘ REC



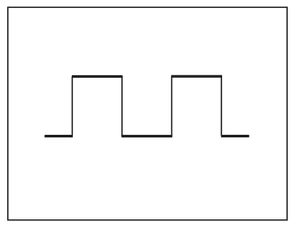
88 mVp-p (H)

❸ IC501 ㉒ PB



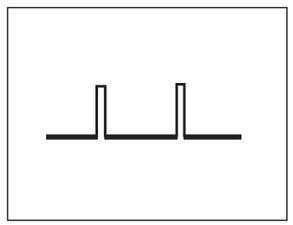
640 mVp-p (H)

❹ IC501 ㉑ REC/PB



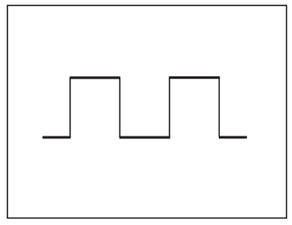
4.6 Vp-p (2 V)

❺ IC501 ⑱ REC/PB



2.5 Vp-p (H)

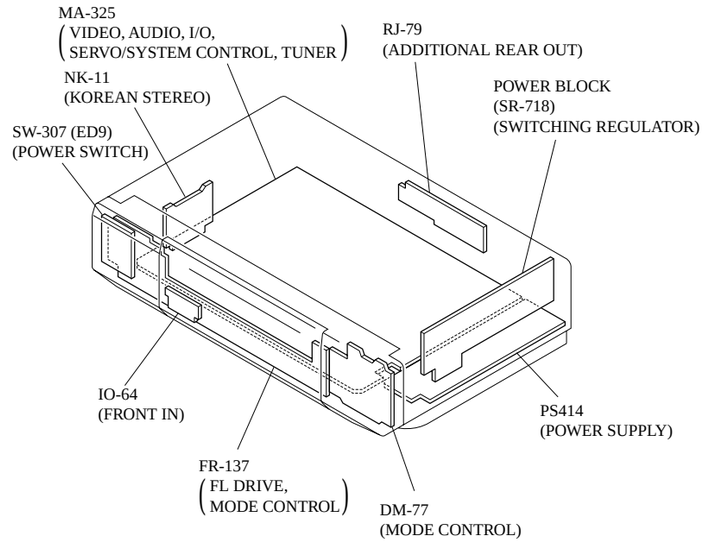
❻ IC501 ⑰ REC/PB



5.1 Vp-p (2 V)

MA-325 BOARD

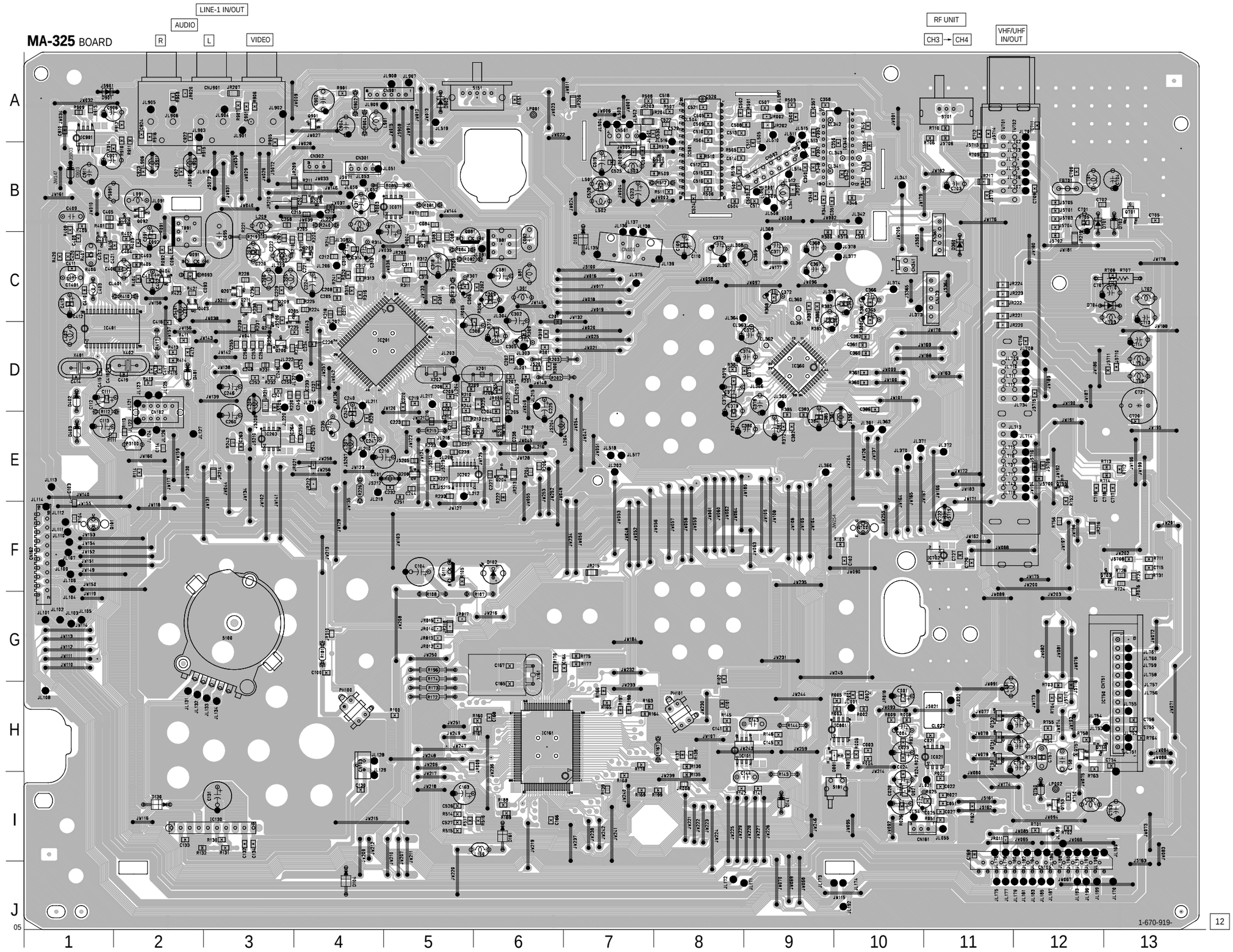
CN101	C-7
CN102	E-2
CN103	H-4
CN105	J-12
CN161	I-11
CN162	F-1
CN301	B-4
CN302	B-4
CN341	C-10
CN423	C-11
CN501	A-7
CN502	B-9
CN751	H-13
CN901	A-5
D102	F-6
D103	C-7
D104	J-4
D130	I-2
D141	I-9
D161	I-6
D360	C-11
D401	D-2
D402	D-1
D403	E-1
D704	C-13
D750	I-12
D902	A-5
D903	B-1
IC001	H-10
IC021	H-11
IC071	B-5
IC101	H-9
IC130	I-3
IC161	H-6
IC201	D-5
IC202	E-5
IC340	B-10
IC360	D-9
IC401	D-1
IC501	B-8
IC901	A-1
Q001	H-10
Q081	C-5
Q091	C-2
Q092	B-2
Q100	F-10
Q101	F-1
Q111	F-5
Q201	E-6
Q202	B-4
Q203	C-4
Q204	E-6
Q206	D-3
Q208	E-5
Q212	E-6
Q301	C-5
Q401	C-1
Q402	B-2
Q403	C-2
Q404	C-2
Q501	B-8
Q703	F-13
Q751	H-11
Q752	H-11
Q753	I-12
Q901	A-4



MA-325 (VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER) PRINTED WIRING BOARD

– Ref. No.: MA-325 board; 2,000 series –

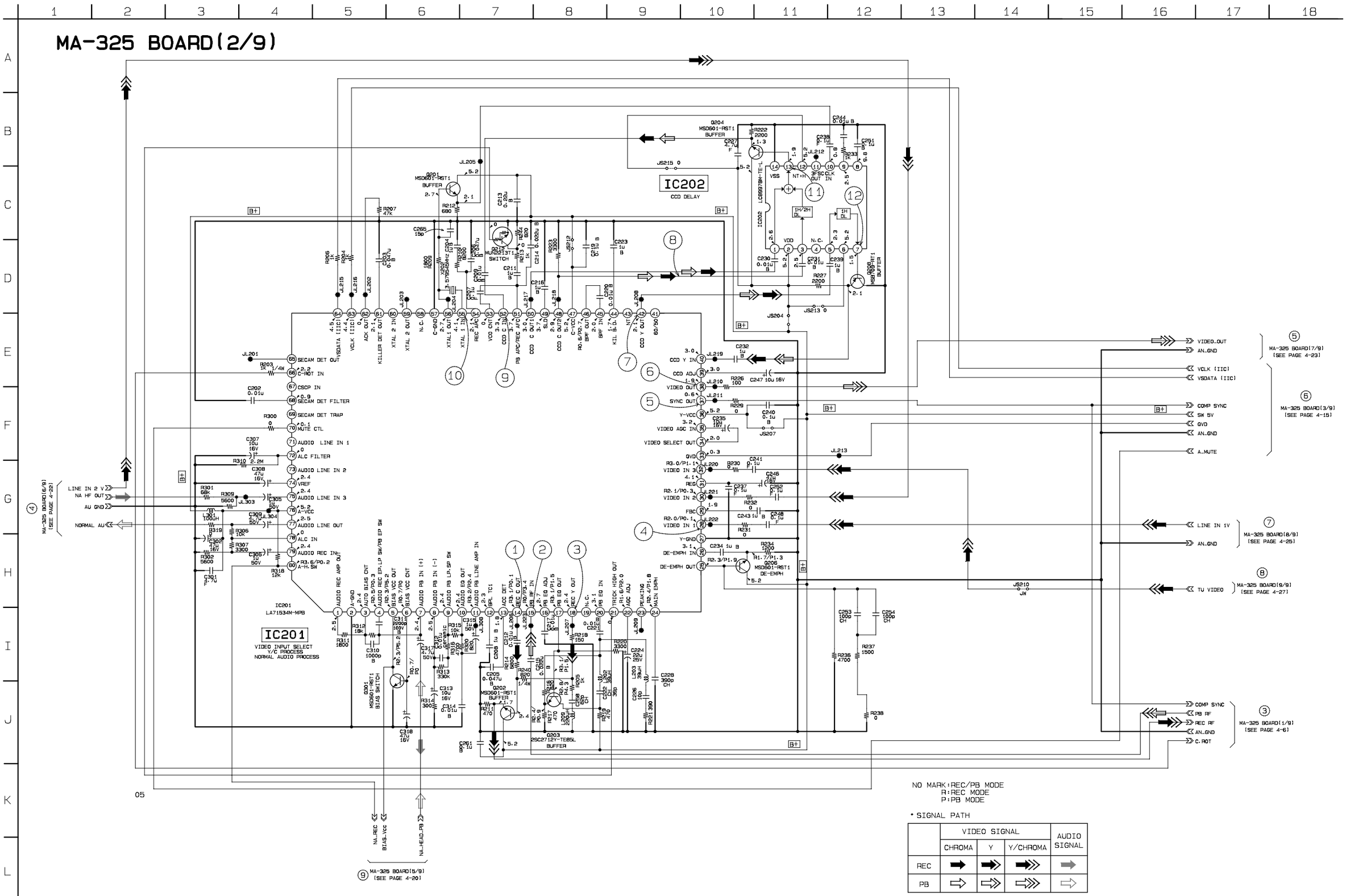
There are few cases that the part isn't mounted in this model is printed on this diagram.



MA-325 (VIDEO, AUDIO) SCHEMATIC DIAGRAM **• See page 4-9 to 4-10 for printed wiring board.**

– Ref. No.: MA-325 board; 2,000 series –

MA-325 BOARD(2/9)



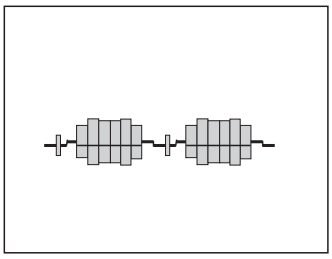
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

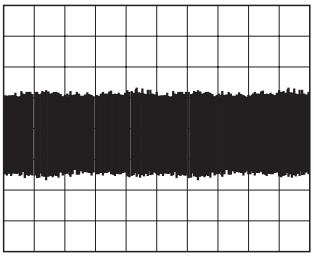
• Waveforms

❶ IC201 ⑭ REC



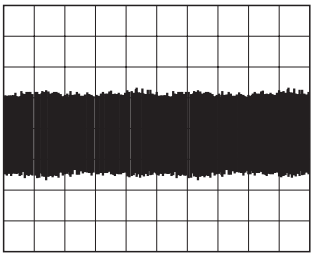
340 mVp-p (H)

❷ IC201 ⑮ PB



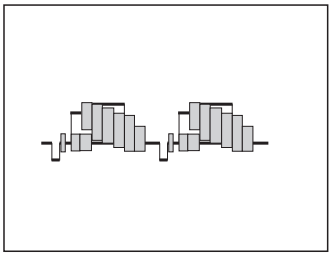
576 mVp-p (H)

❸ IC201 ⑱ REC



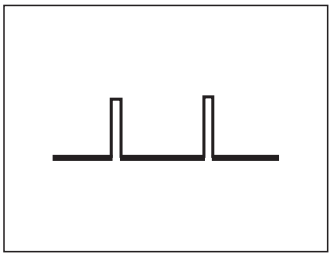
310 mVp-p (H)

❹ IC201 ㉘ REC



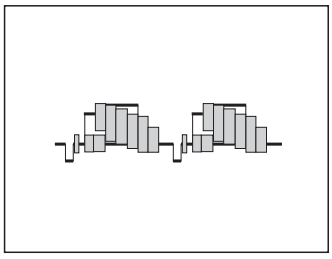
1 Vp-p (H)

❺ IC201 ㊲ REC/PB



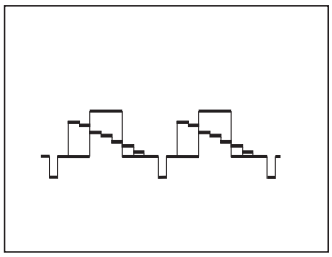
4.4 Vp-p (H)

❻ IC201 ㊳ REC/PB



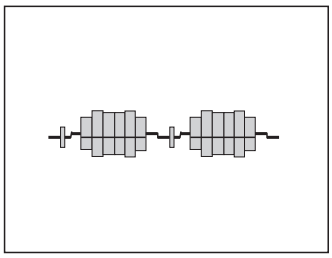
2.0 Vp-p (H)

❼ IC201 ㊷ REC/PB



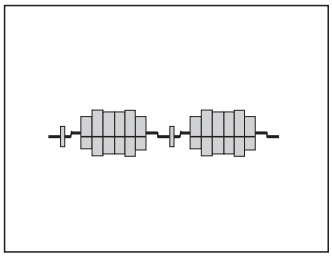
REC : 440 mVp-p (H)
PB : 400 mVp-p (H)

❽ IC201 ㊽ REC/PB



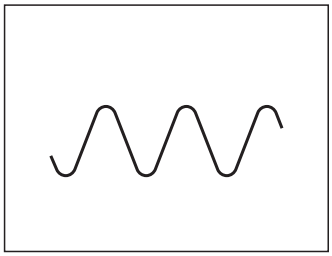
REC : 320 mVp-p (H)
PB : 270 mVp-p (H)

❾ IC201 ㊷ REC/PB



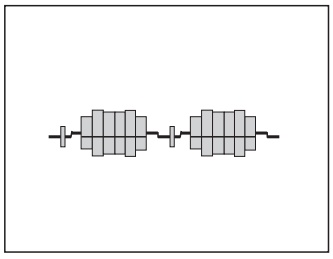
REC : 340 mVp-p (H)
PB : 270 mVp-p (H)

❿ IC201 ㊺ REC/PB



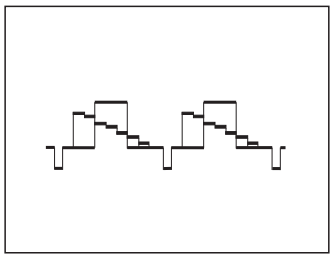
552 mVp-p (3.58 MHz)

⓫ IC202 ⑬ REC/PB



REC : 360 mVp-p (H)
PB : 270 mVp-p (H)

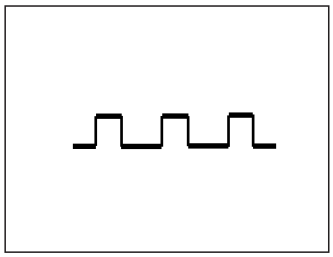
⓬ IC202 ⑦ REC/PB



400 mVp-p (H)

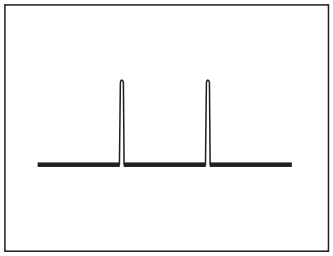
• **Waveforms**

❶ IC161 ㊼ PB



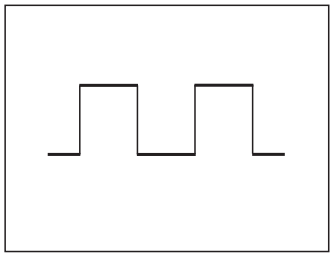
5.3 Vp-p (2 V)

❷ IC161 ㊽ REC/PB



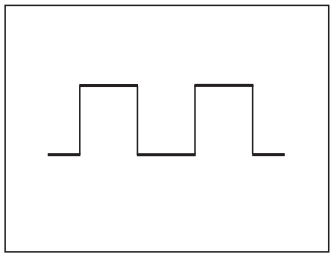
5.0 Vp-p (2 V)

❸ IC161 ㊾ REC/PB



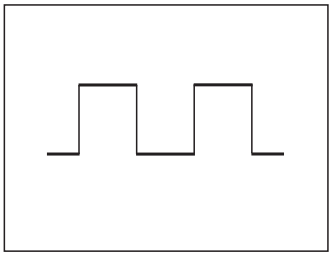
5.0 Vp-p (360 Hz)

❹ IC161 ㊿ REC/PB



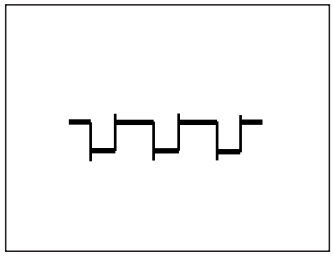
5.1 Vp-p (1 kHz)

❺ IC161 ① REC/PB



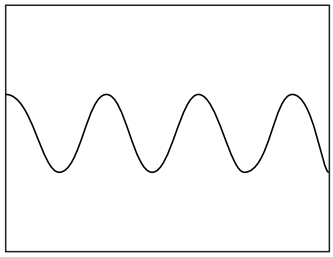
5.1 Vp-p (2 V)

❻ IC161 ⑦ REC



5.0 Vp-p (2 V)

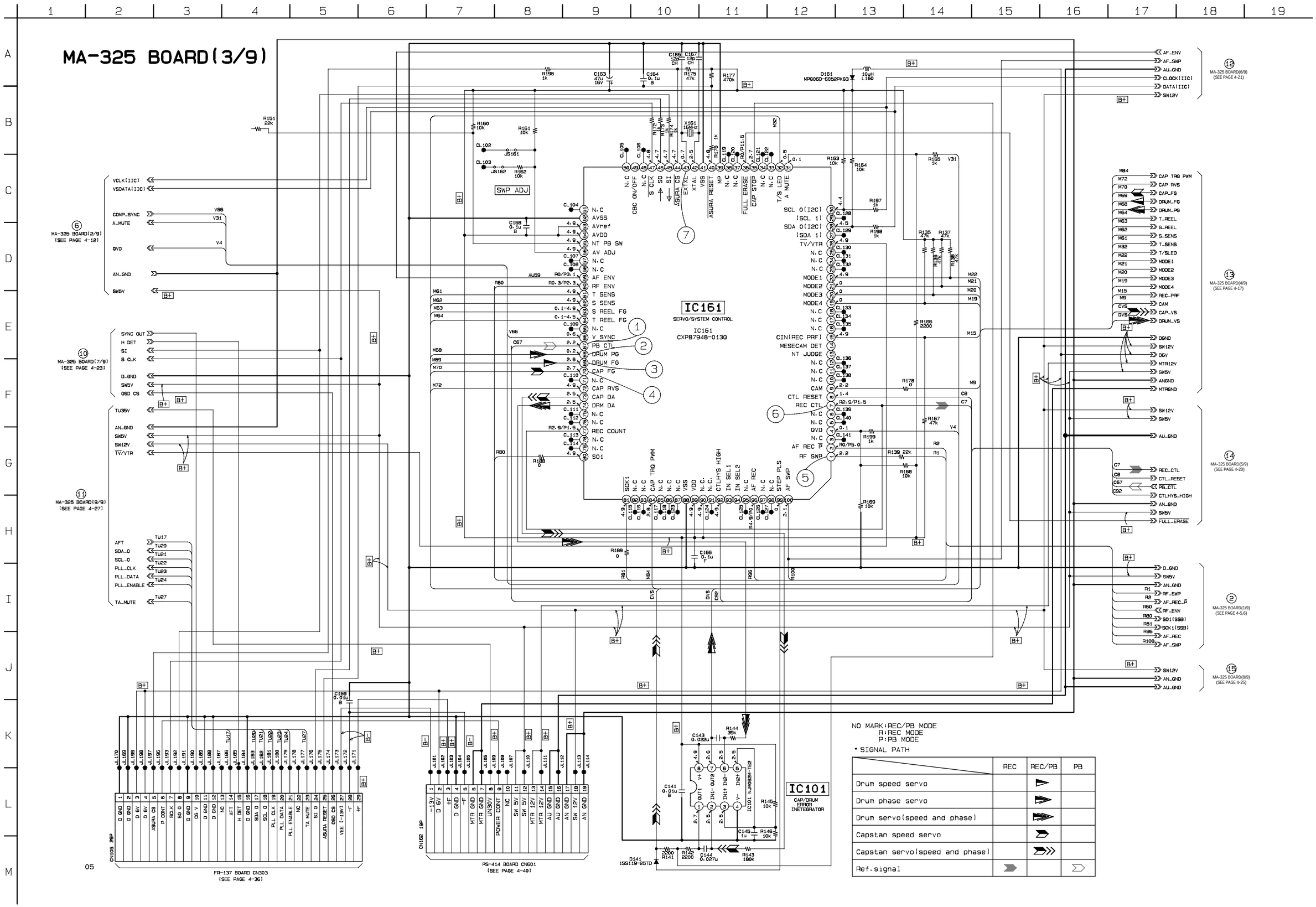
❼ IC161 ㊸ REC/PB



2.4 Vp-p (16 MHz)

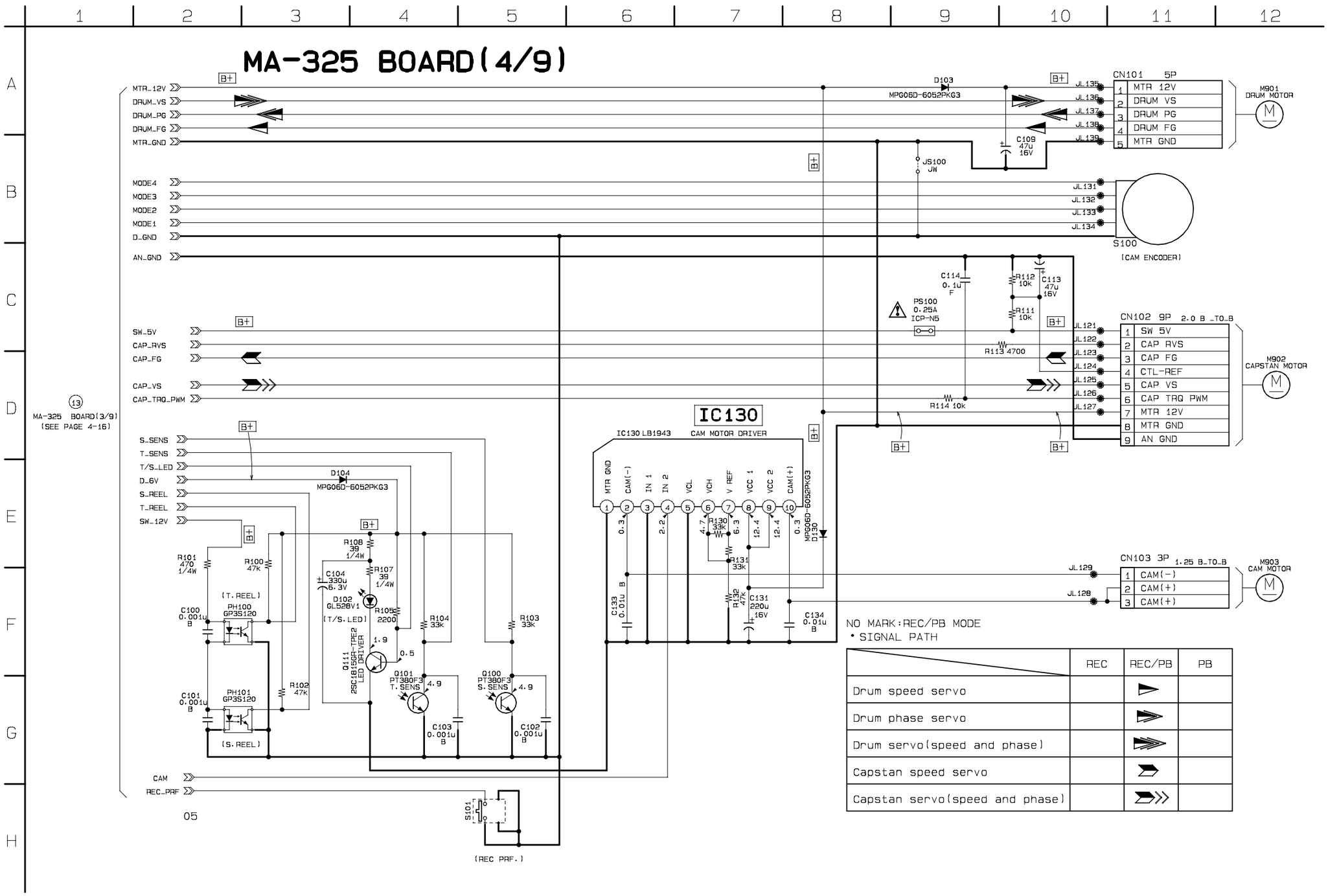
MA-325 (SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-9 to 4-10 for printed wiring board.

– Ref. No.: MA-325 board; 2,000 series –



MA-325 (SERVO CONTROL) SCHEMATIC DIAGRAM **• See page 4-9 to 4-10 for printed wiring board.**

– Ref. No.: MA-325 board; 2,000 series –

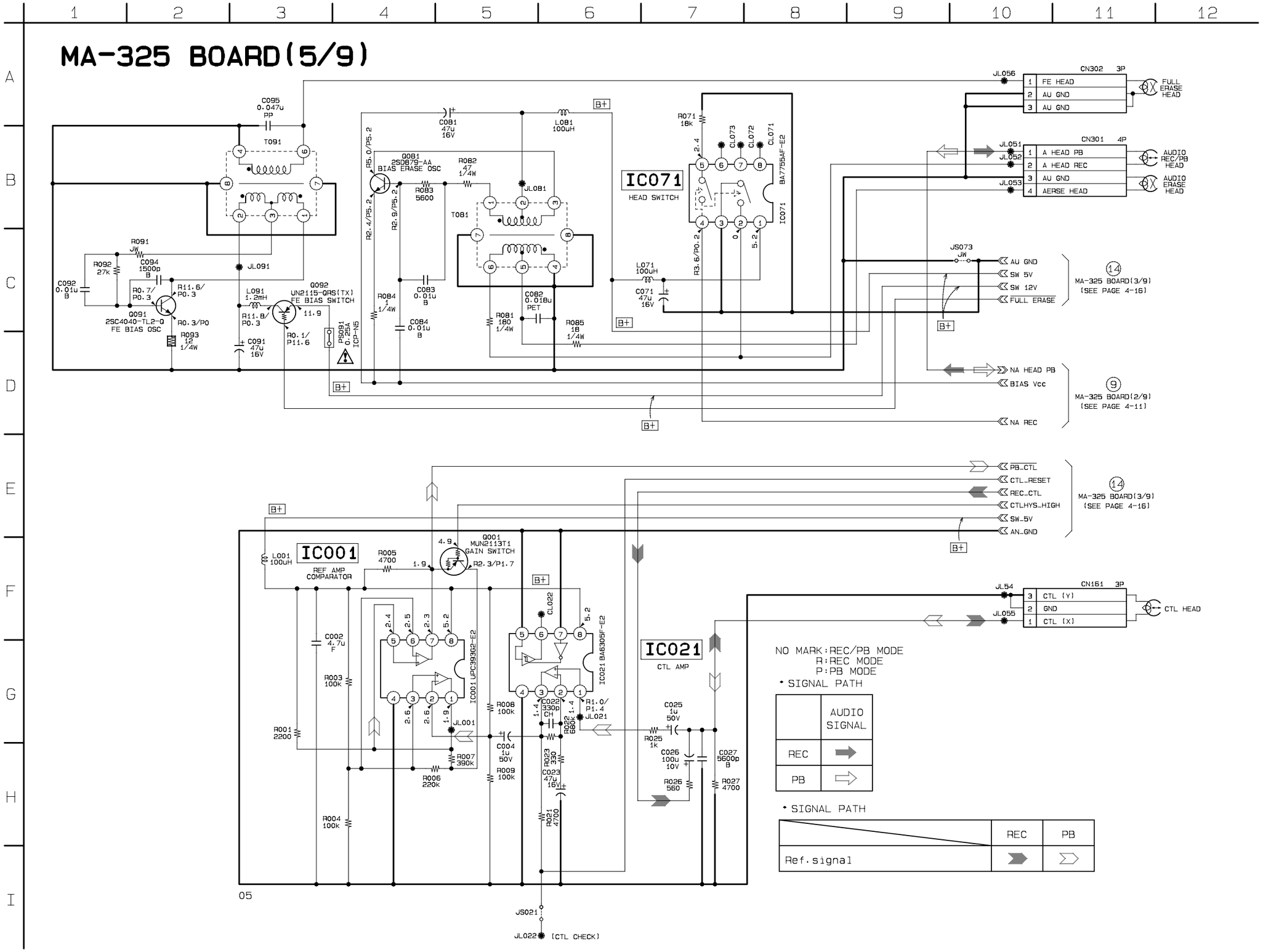


	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo(speed and phase)		▶▶▶	
Capstan speed servo		▶	
Capstan servo(speed and phase)		▶▶▶	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-325 (BIAS, CTL) SCHEMATIC DIAGRAM **• See page 4-9 to 4-10 for printed wiring board.**

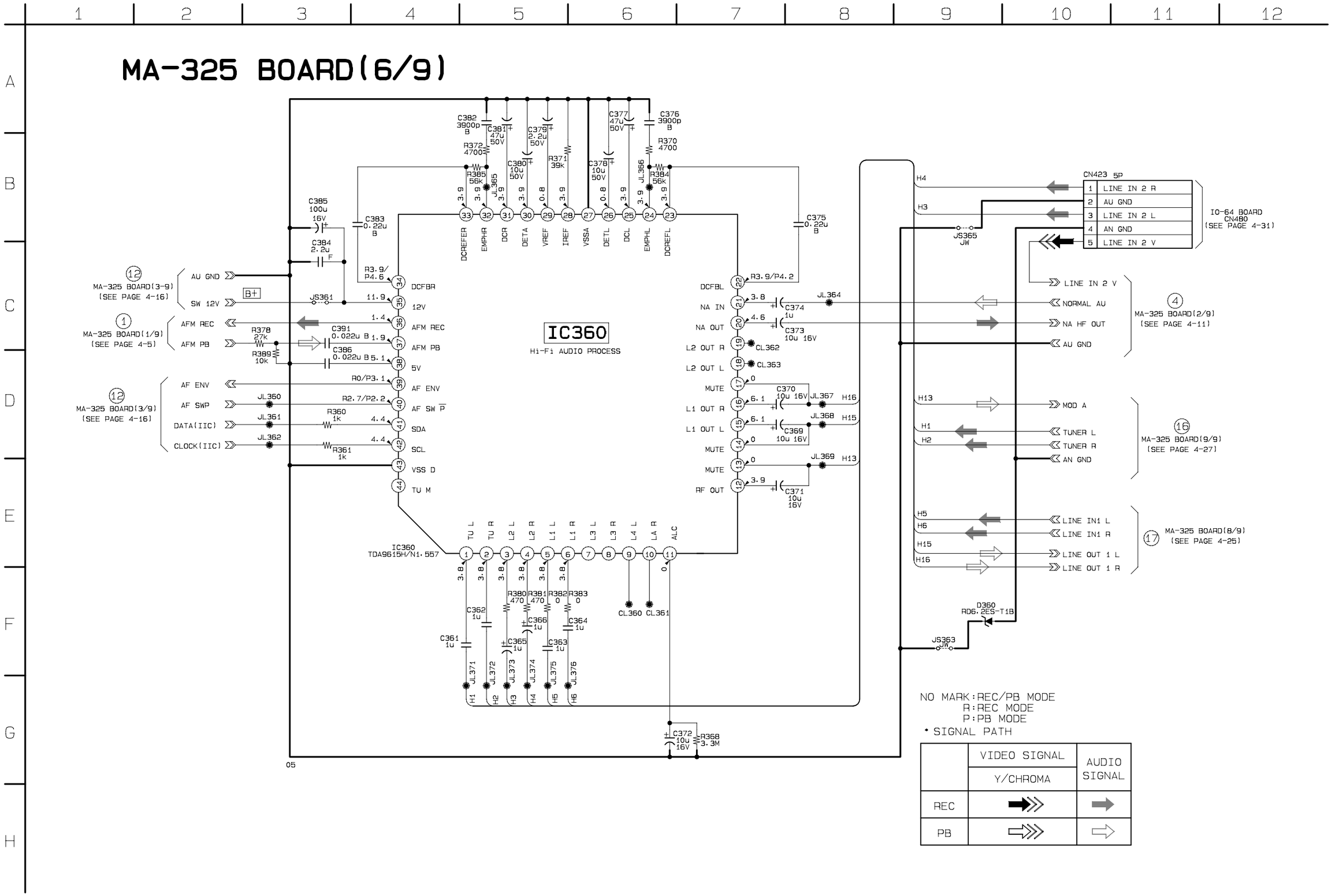
– Ref. No.: MA-325 board; 2,000 series –



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

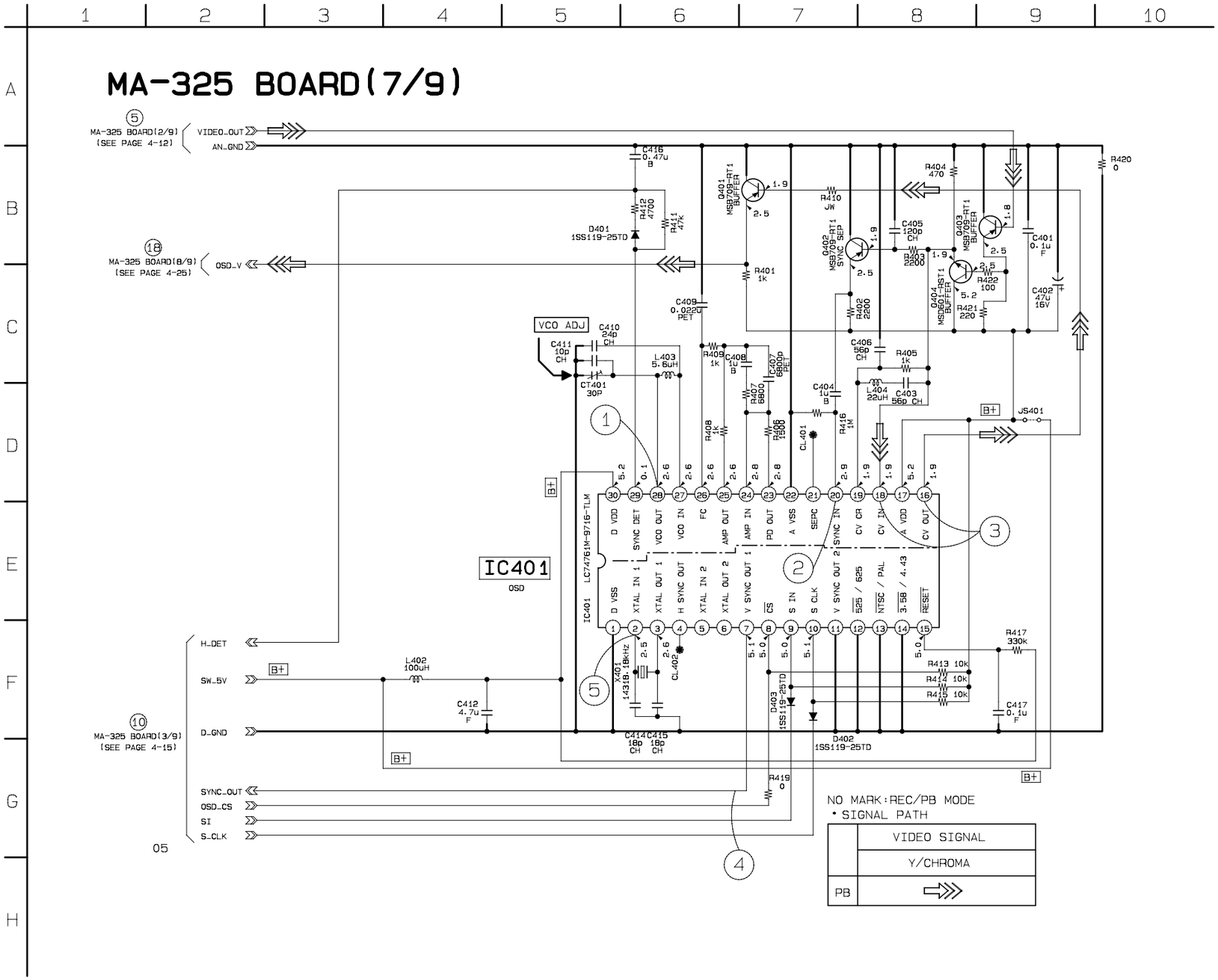
MA-325 (Hi-Fi, AUDIO) SCHEMATIC DIAGRAM • See page 4-9 to 4-10 for printed wiring board.

– Ref. No.: MA-325 board; 2,000 series –



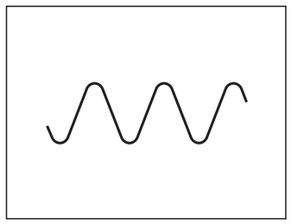
MA-325 (OSD) SCHEMATIC DIAGRAM **• See page 4-9 to 4-10 for printed wiring board.**

– Ref. No.: MA-325 board; 2,000 series –



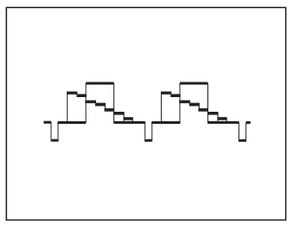
• Waveforms

❶ IC401 ㉘ REC/PB



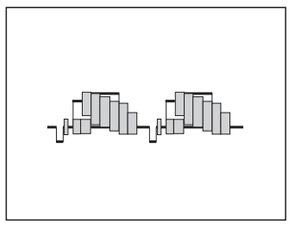
3.6 Vp-p (13.89 MHz)

❷ IC401 ⑳ REC/PB



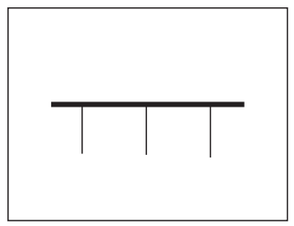
1.9 Vp-p (H)

❸ IC401 ⑯⑱ REC/PB



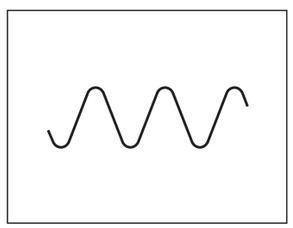
2.0 Vp-p (H)

❹ IC401 ⑦ REC/PB



5.2 Vp-p (2 V)

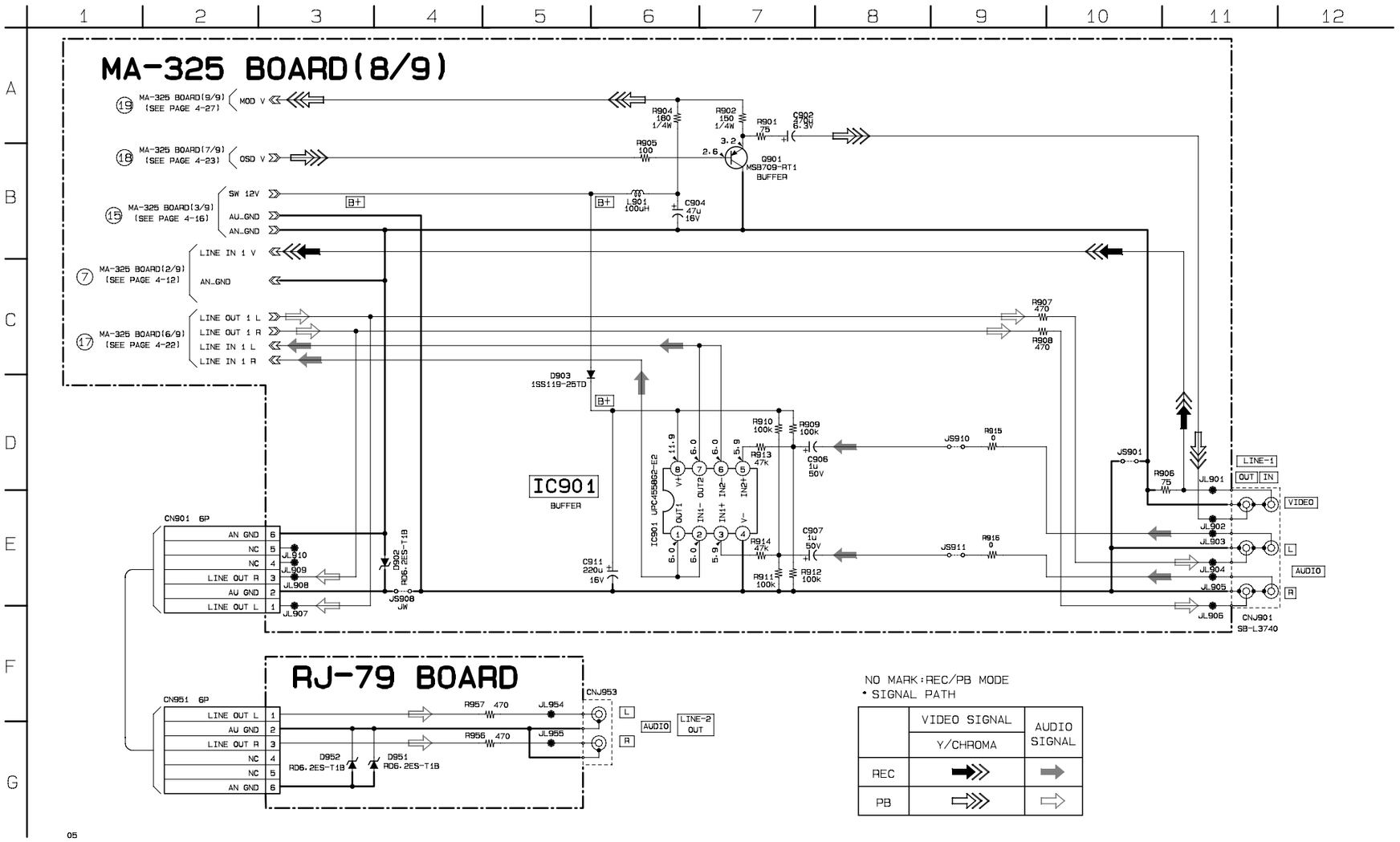
❺ IC401 ② REC/PB



1.6 Vp-p (17.73 MHz)

MA-325 (I/O), RJ-79 (ADDITIONAL REAR OUT) SCHEMATIC DIAGRAMS AND RJ-79 PRINTED WIRING BOARD • See page 4-9 to 4-10 for printed wiring board.

– Ref. No.: MA-325 board; 2,000 series, RJ-79 board; 1,000 series –

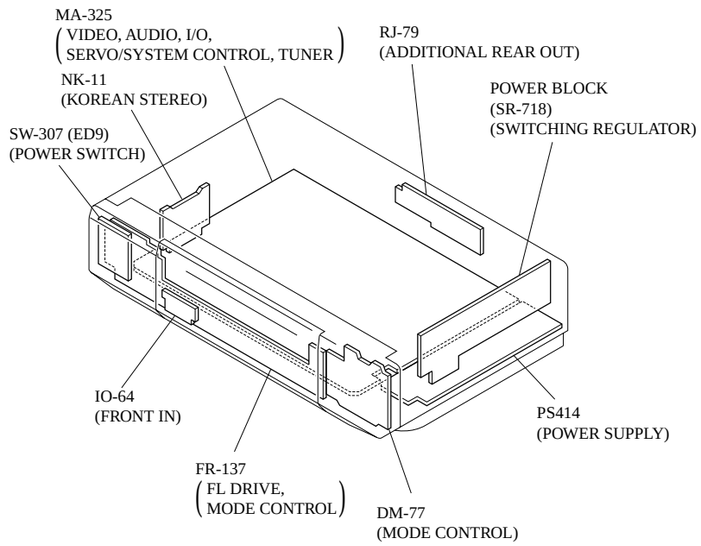


There are few cases that the part isn't mounted in this model is printed on this diagram.

RJ-79 BOARD

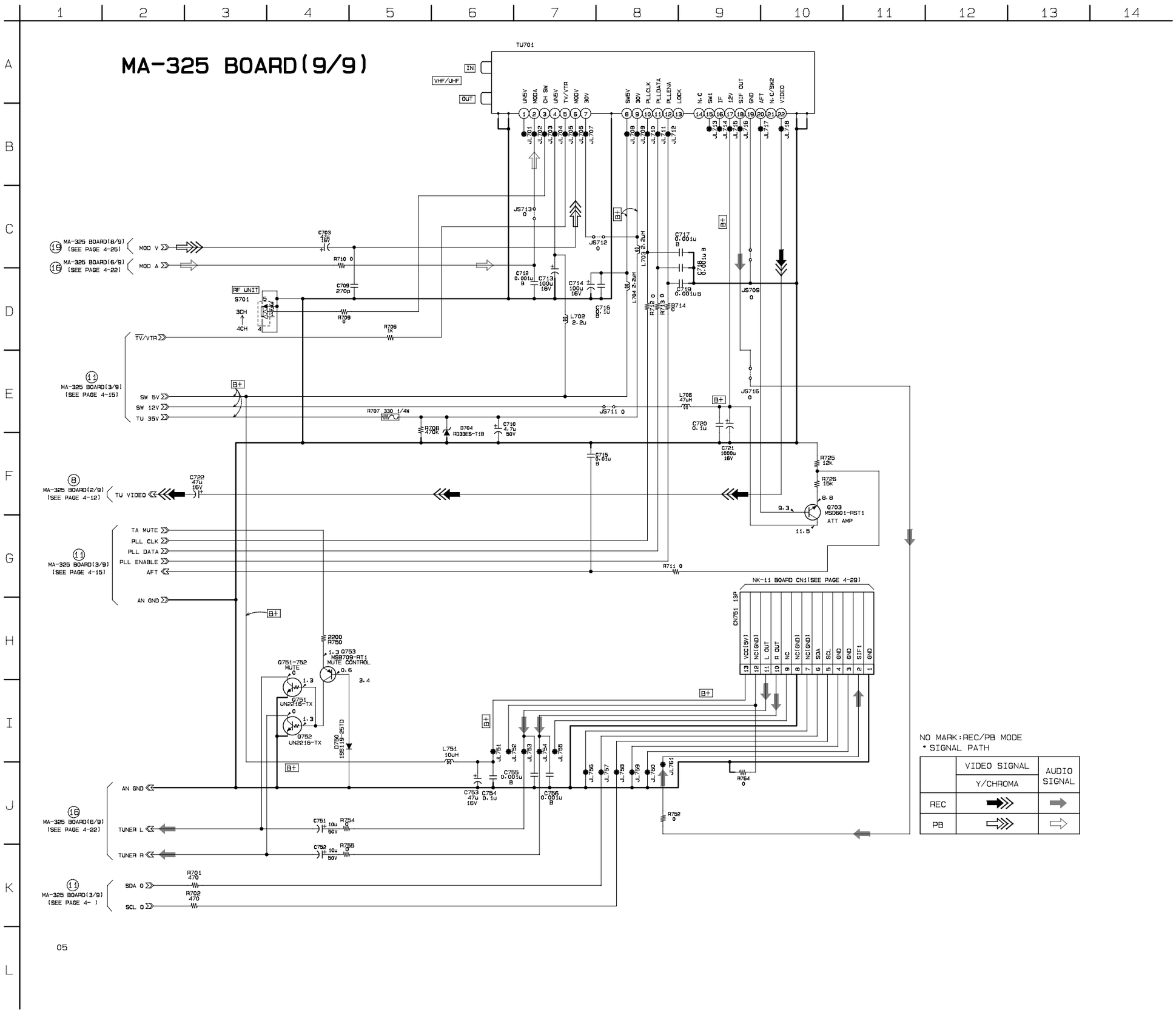
CN951 A-4

D951 B-2
D952 A-1



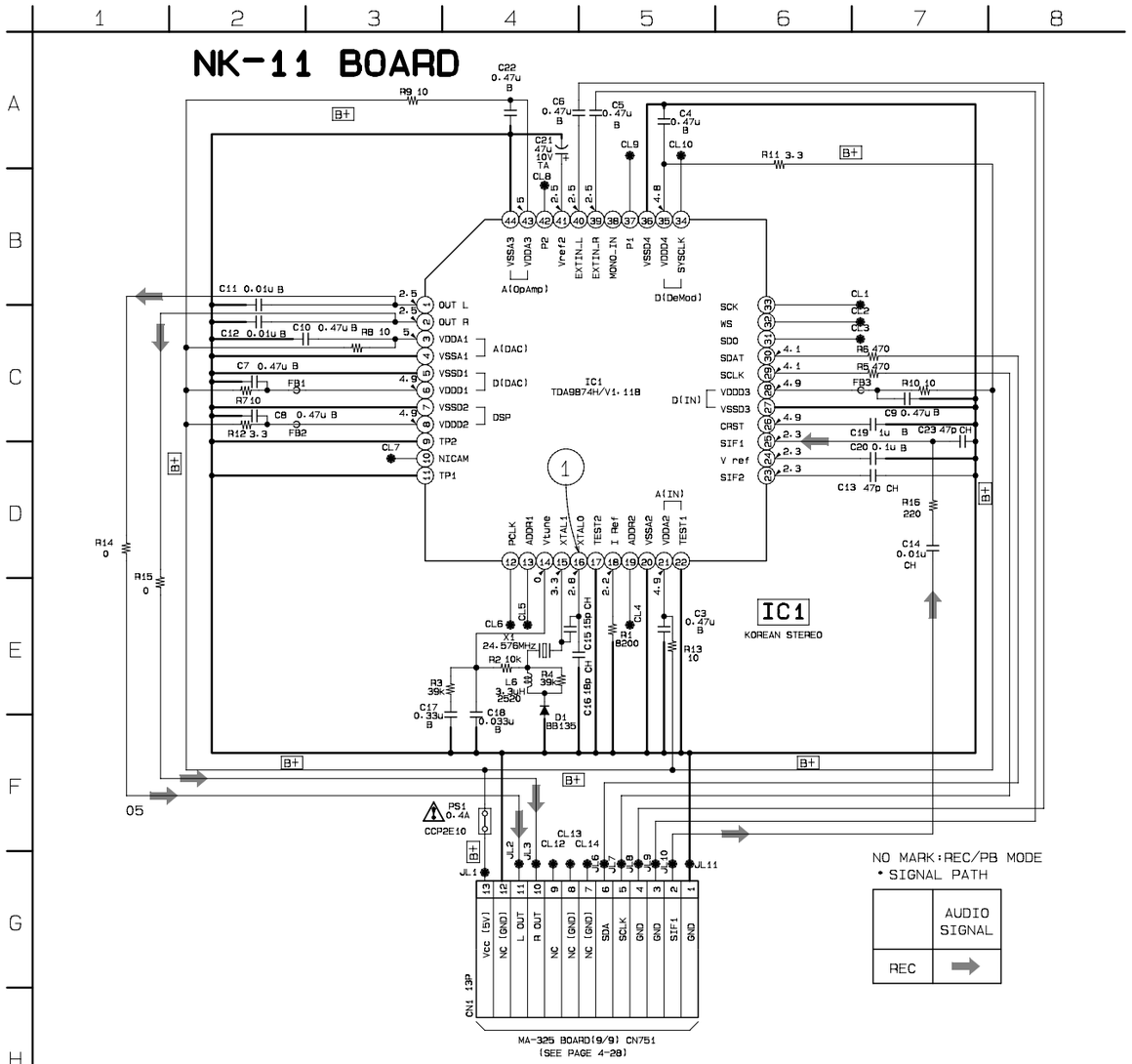
MA-325 (TUNER) SCHEMATIC DIAGRAM **• See page 4-9 to 4-10 for printed wiring board.**

– Ref. No.: MA-325 board; 2,000 series –



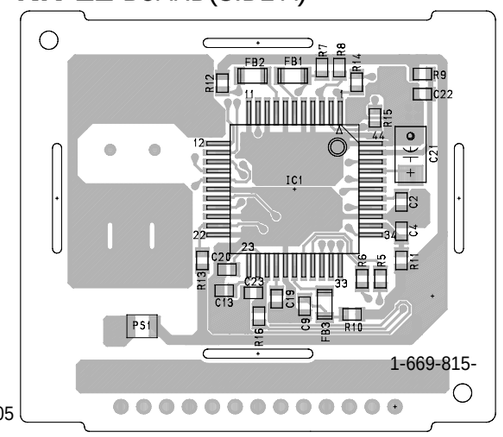
NK-11 (KOREAN STEREO) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: NK-11 board; 1,000 series –



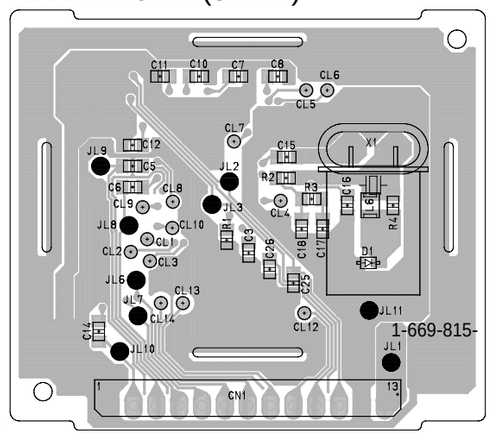
There are few cases that the part isn't mounted in this model is printed on this diagram.

NK-11 BOARD(SIDE A)



12
(12)

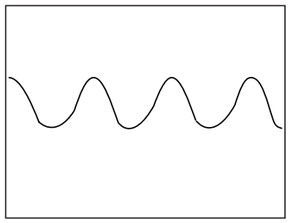
NK-11 BOARD(SIDE B)



12
(12)

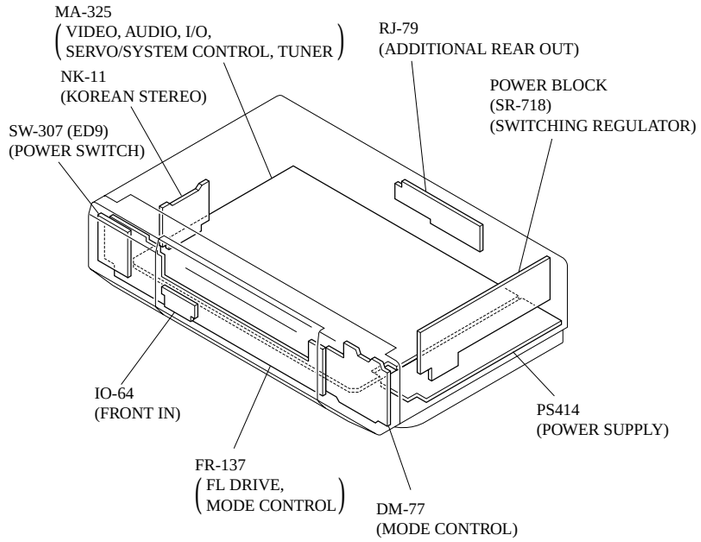
• **Waveform**

❶ IC1 ⑯ REC/PB



740 mVp-p (24.576 MHz)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



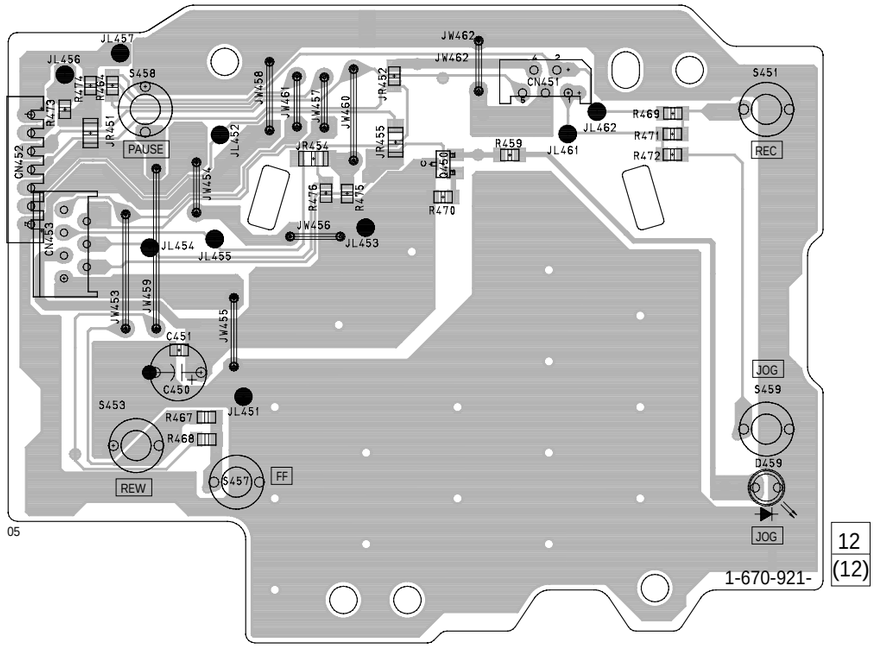
KOREAN STEREO
NK-11

DM-77 (MODE CONTROL), IO-64 (FRONT IN) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

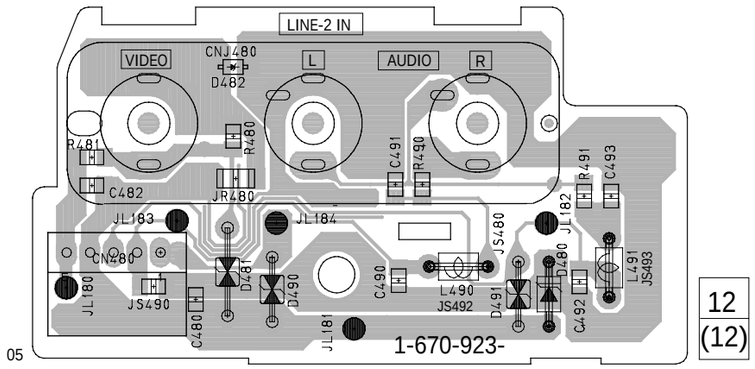
– Ref. No.: DM-77 board, IO-64 board; 1,000 series –

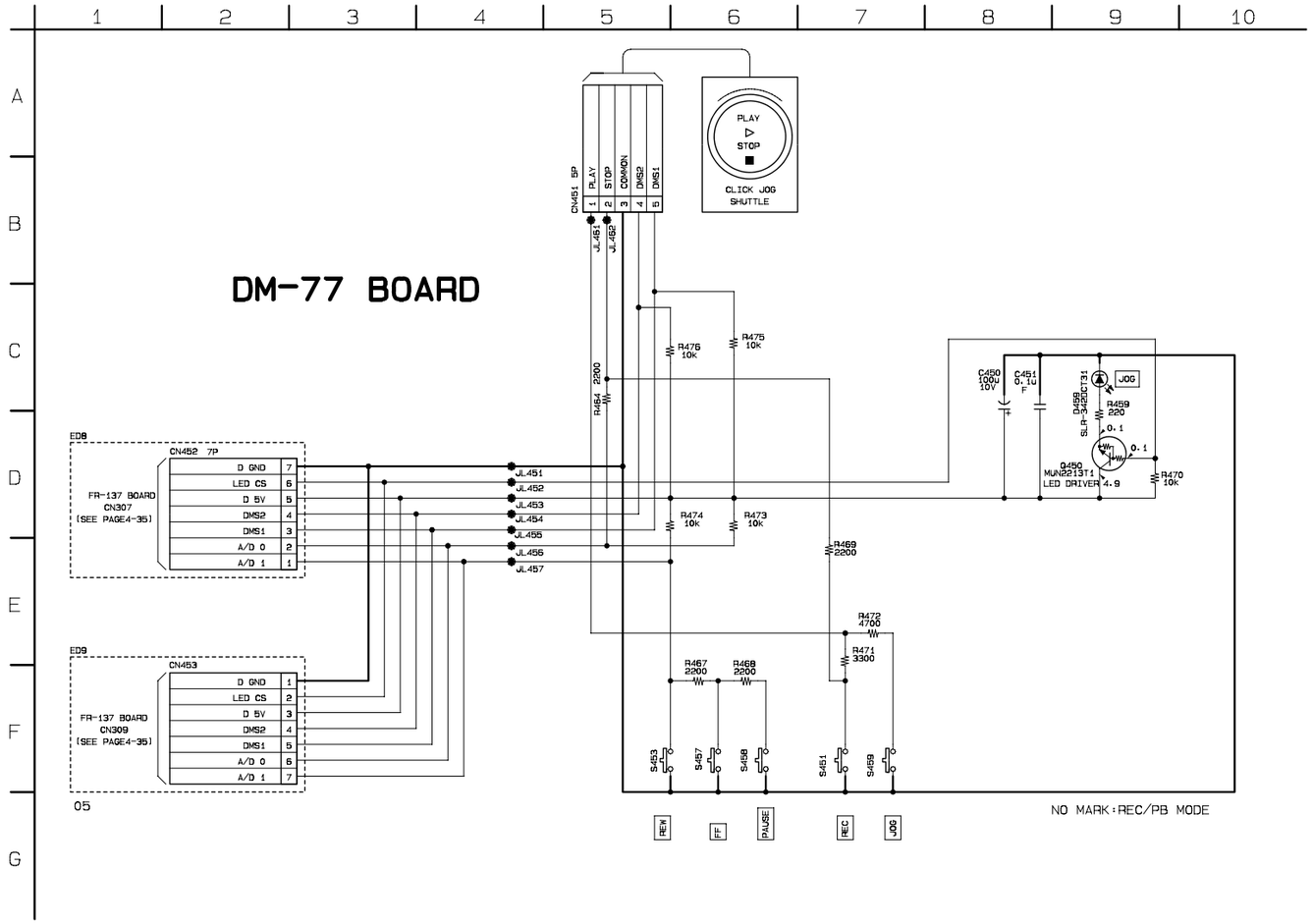
There are few cases that the part isn't mounted in this model is printed on this diagram.

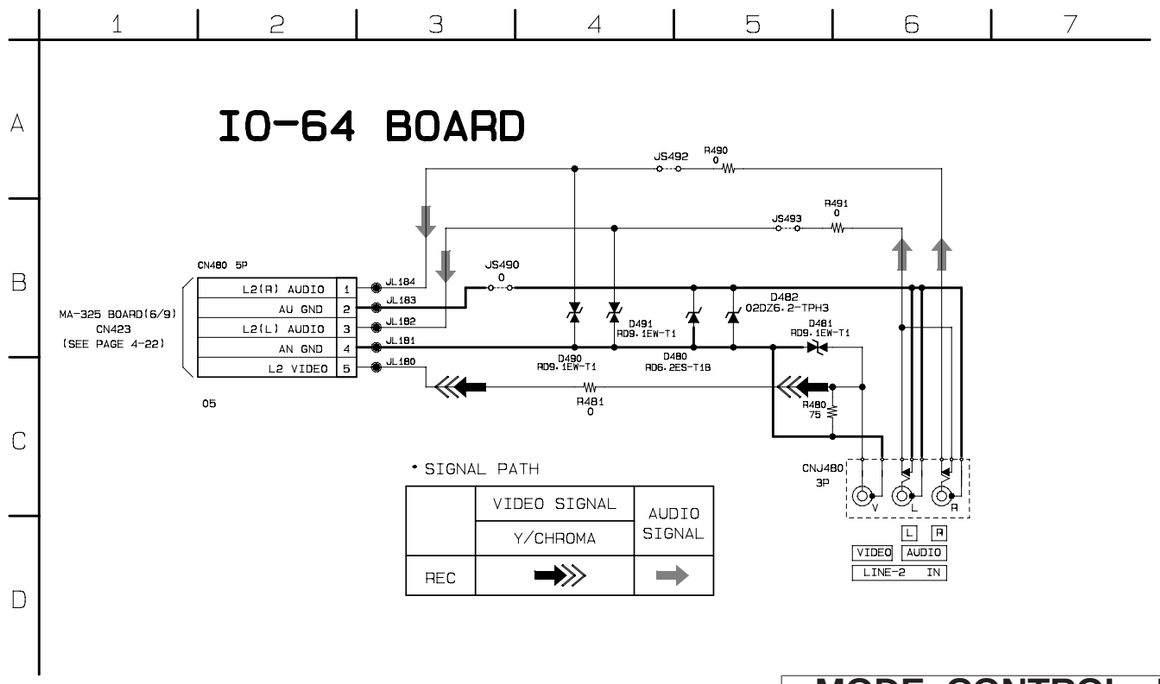
DM-77 BOARD



IO-64 BOARD





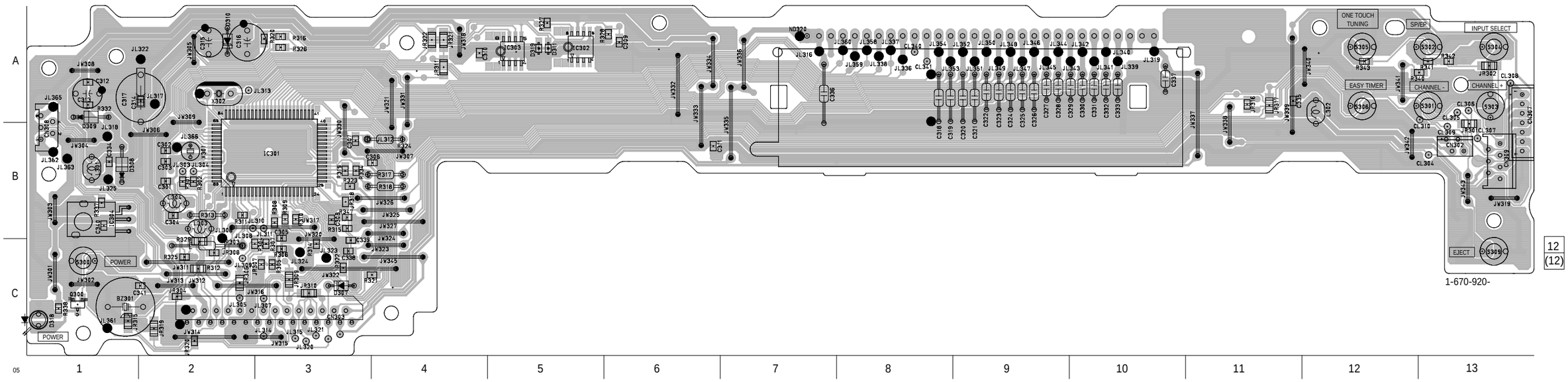


FR-137 (FL DRIVE, MODE CONTROL), SW-307 (POWER SWITCH) PRINTED WIRING BOARDS

– Ref. No.: FR-137 board, SW-307 board; 1,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

FR-137 BOARD



FR-137 BOARD

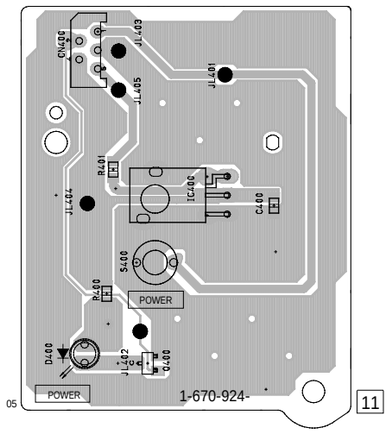
CN302 B-13
CN303 C-3
CN307 A-13
CN308 B-1
CN309 B-13

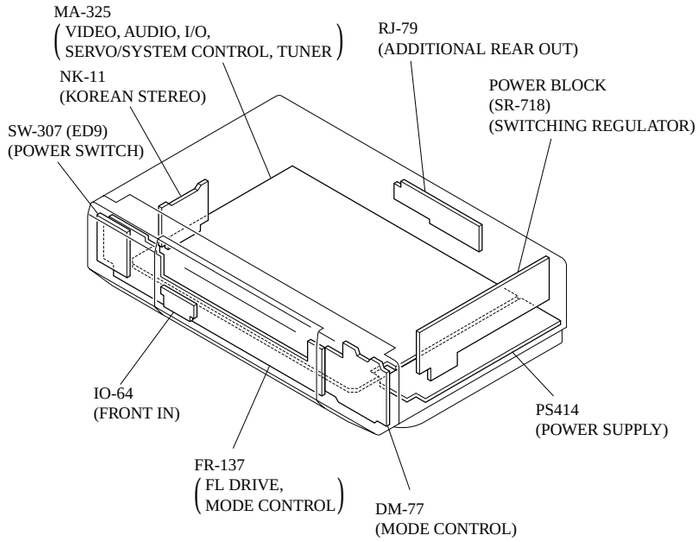
D307 C-3
D308 B-1
D309 A-1
D311 A-5
D318 C-1
D319 A-5

IC301 B-3
IC302 A-5
IC303 A-5
IC304 B-1

Q300 C-1

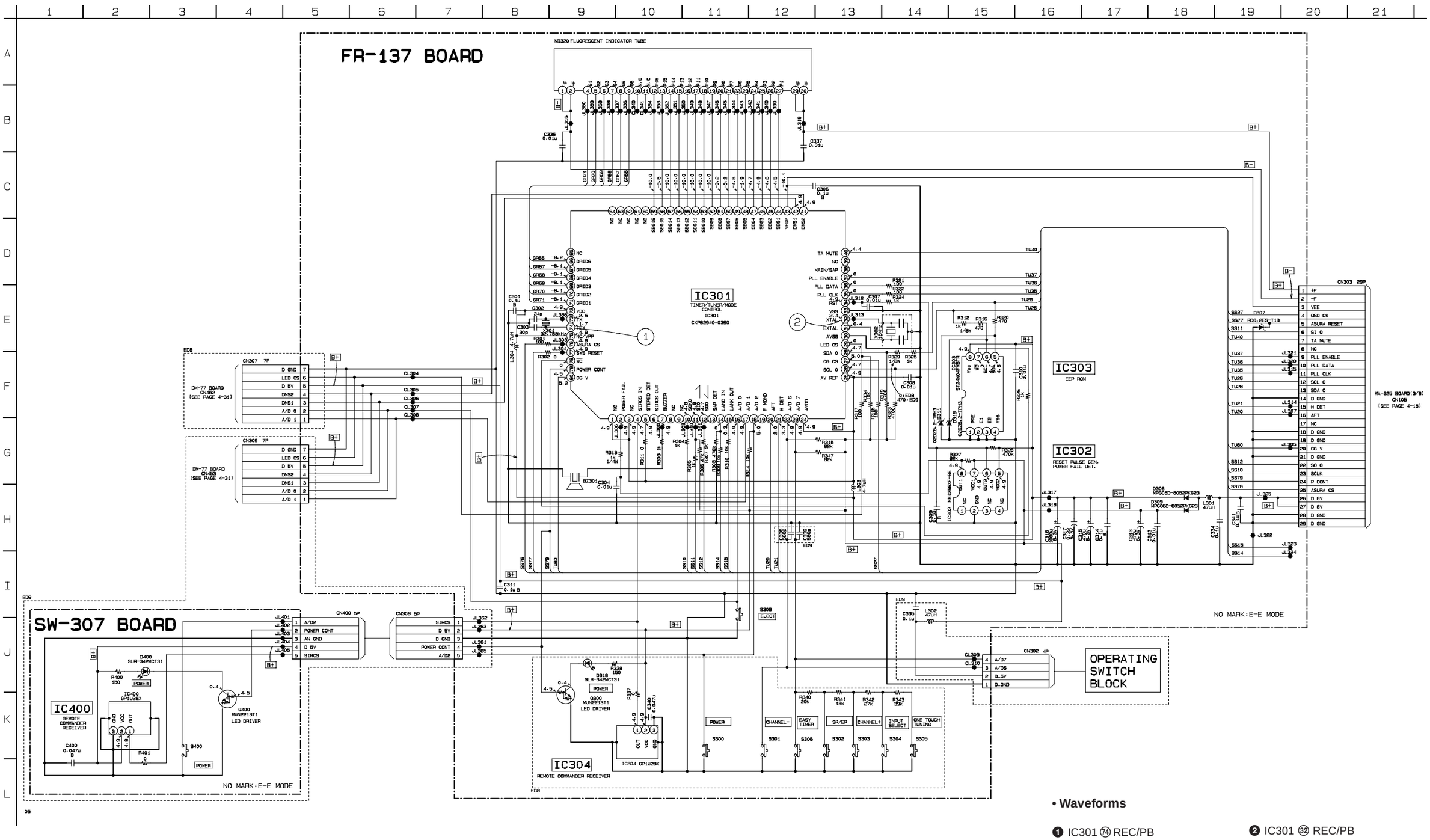
SW-307 BOARD





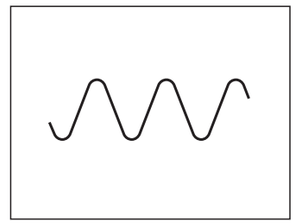
FR-137 (FL DRIVE, MODE CONTROL), SW-307 (POWER SWITCH) SCHEMATIC DIAGRAM

– Ref. No.: FR-137 board, SW-307 board; 1,000 series –



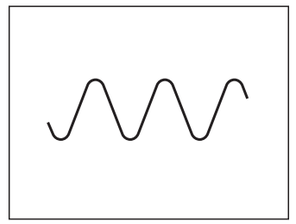
• **Waveforms**

❶ IC301 ⑭ REC/PB



2.3 Vp-p (32.77 kHz)

❷ IC301 ㉜ REC/PB



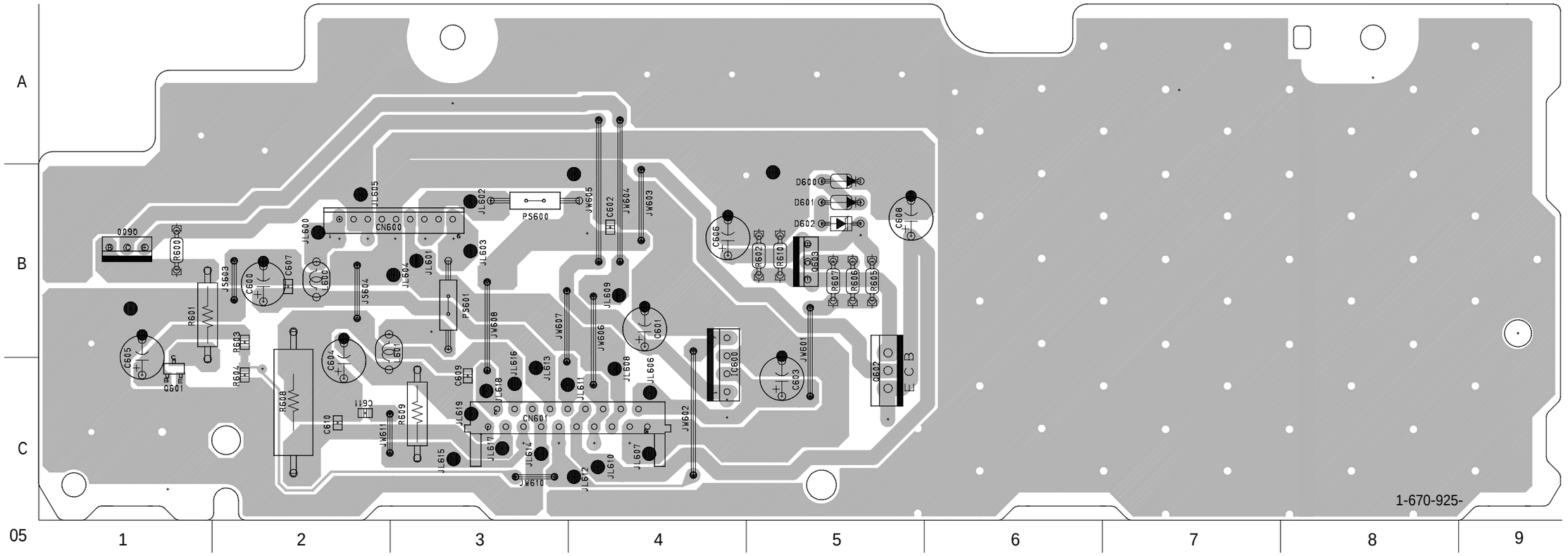
2.0 Vp-p (16 MHz)

PS-414 (POWER SUPPLY) PRINTED WIRING BOARD

– Ref. No.: PS-414 board; 1,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

PS-414 BOARD



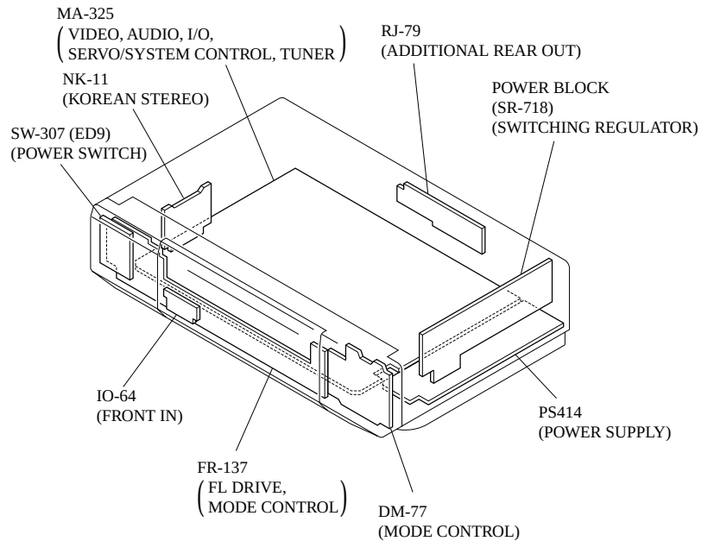
PS-414 BOARD

CN600 B-3
CN601 C-3

D600 A-5
D601 B-5
D602 B-5

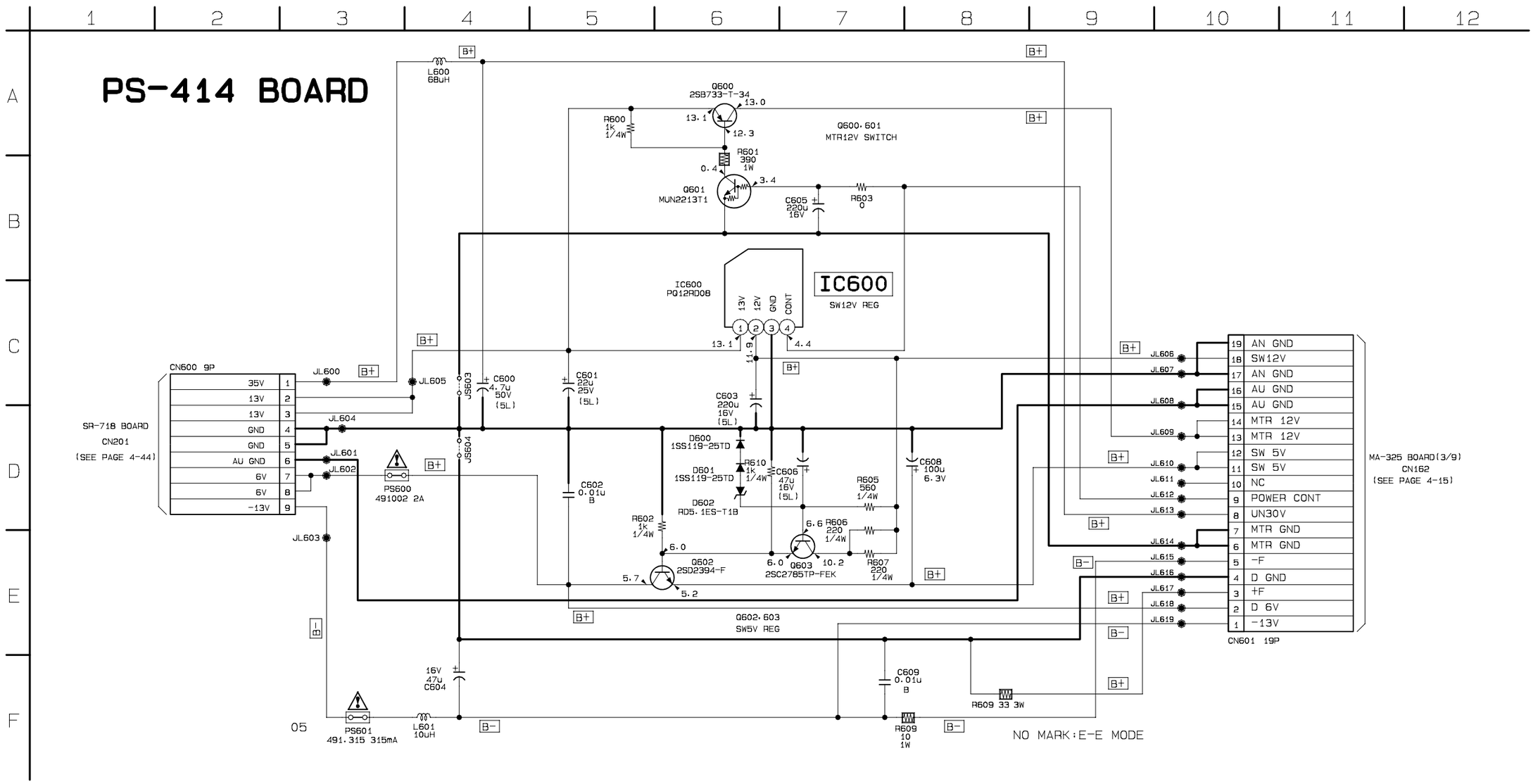
IC600 C-4

Q600 B-1
Q601 C-1
Q602 C-5
Q603 B-5



PS-414 (POWER SUPPLY) SCHEMATIC DIAGRAM

– Ref. No.: PS-414 board; 1,000 series –

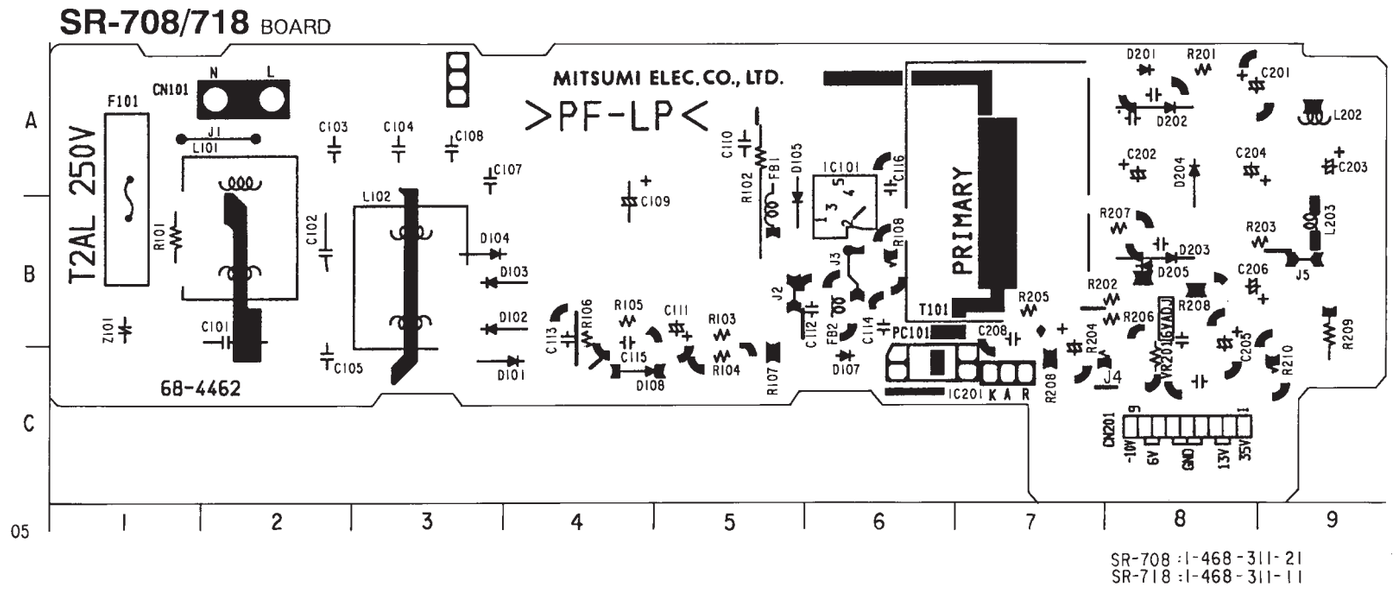


Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SR-718 (SWITCHING REGULATOR) PRINTED WIRING BOARD

– Ref. No.: SR-718 board; 4,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

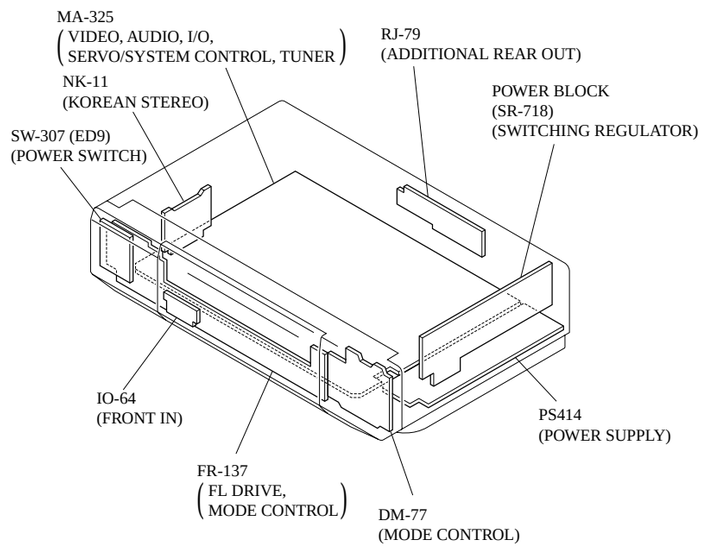


SR-718 BOARD

CN101 A-2
CN201 C-8

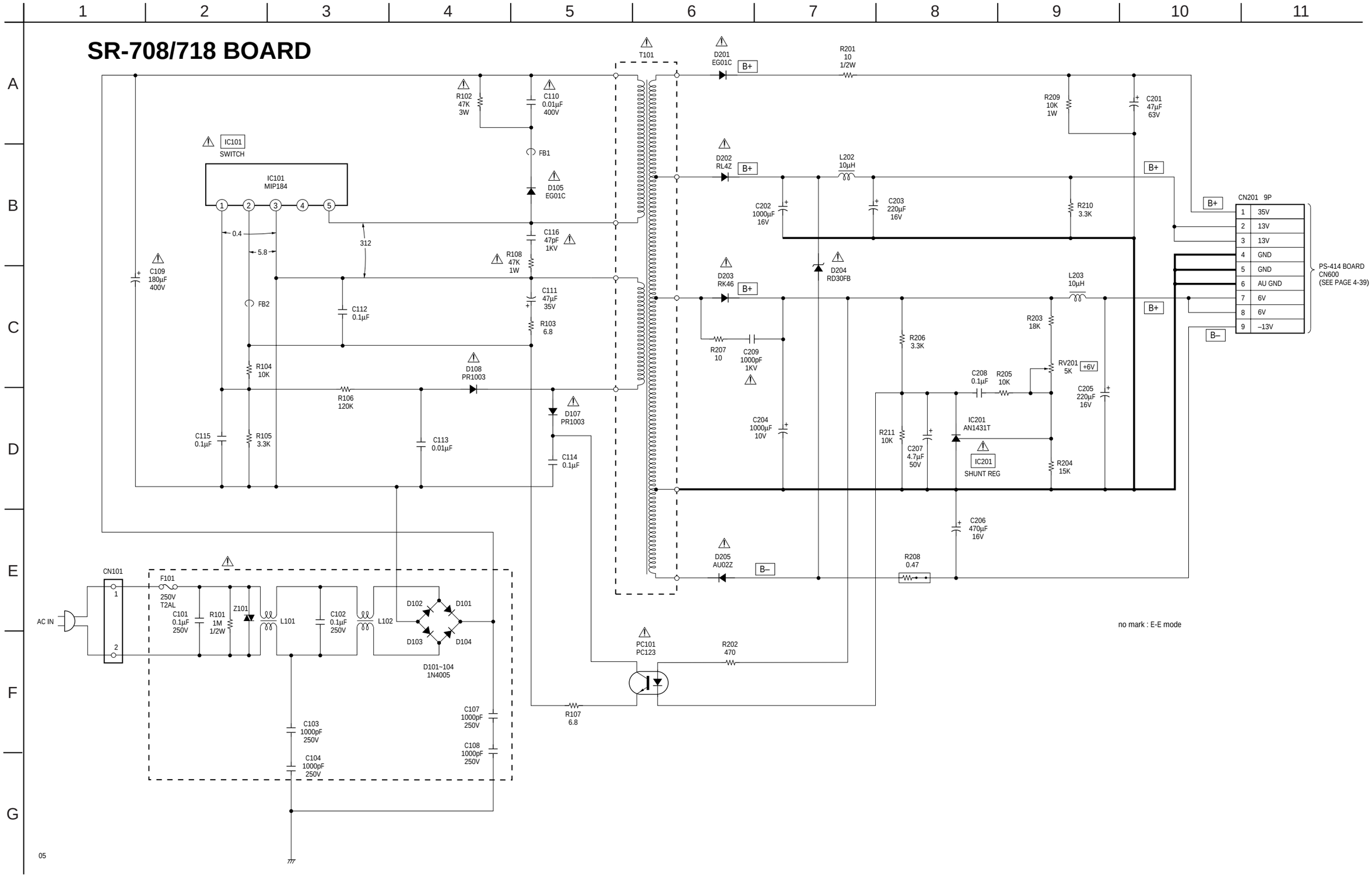
D101 C-3
D102 B-3
D103 B-3
D104 B-3
D105 B-5
D107 C-6
D108 C-4
D201 A-8
D202 A-8
D203 B-8
D204 A-8
D205 B-8

IC101 B-6
IC201 C-7



SR-718 (SWITCHING REGULATOR) SCHEMATIC DIAGRAM

– Ref. No.: SR-718 board; 4,000 series –



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SWITCHING REGULATOR
SR-718

5-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-325 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
RF SWP (SW30)	MA-325 IC161①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-325 IC161④	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
V SYNC	MA-325 IC161⑯	I	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4

∗1. 30 Hz pulse with 50% duty cycle. Synchronized with rotation of drum.
∗2. Normally “L”. “H” when CTL sibnal is not generated.
∗3. V period “H” pulse.
∗4. Composite sync signal (positive polarity).

5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-325 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
REC CTL	MA-325 IC161⑦	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*2	Hi-Z	Hi-Z	Hi-Z	*1	Hi-Z
$\overline{\text{CAP STOP}}$	MA-325 IC161㉟	$\overline{O}$ ($\overline{O}$.D)	L	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)	Hi-Z (O.D)	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)	L	*3	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)	Hi-Z ($\overline{O}$.D)
STEP PLS	MA-325 IC161㊴	$\overline{O}$	L	L	L	L	L	L	L	*2	L	L	L	L	L
$\overline{\text{PB CTL}}$	MA-325 IC161㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
DRM PG	MA-325 IC161㊽	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1
DRM FG	MA-325 IC161㊾	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	MA-325 IC161㊿	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L
CAP DA	MA-325 IC161(73)	$\overline{O}$	*8	*8	*8	*8	*8	*9	*8	*8	*9	*9	*9	*9	*8
DRM DA	MA-325 IC161(74)	$\overline{O}$	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10
CTL RESET	MA-325 IC161⑧	I/$\overline{O}$	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*11	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z

∗1. 30 Hz pulse.
∗2. Pulse at tape running.
∗3. Reverse logic pulse of STEP PLS.
∗4. “L” when drum rotation stop.
∗5. Unstable period pulse.
∗6. Pulse of period in proportion to tape speed.
∗7. 360 Hz pulse.
∗8. Pulse at tape running.
∗9. Approx. 2 msec period “H” or “L” pulse.
∗10. Approx. 1.5 msec period “H” or “L” pulse.
∗11. “L” when FWD slow, “H” when RVS slow.

5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-325 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
CAM	MA-325 IC161⑨	O	Hi-Z	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1	MA-325 IC161㉒	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-325 IC161㉑	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3	MA-325 IC161⑳	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4	MA-325 IC161⑲	I	L	H	H	*1	*1	L	H	H	L	L	L	L	L	L	L	L
C IN REC PRF	MA-325 IC161⑮	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	MA-325 IC161㊹	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	MA-325 IC161㊸	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/S LED	MA-325 IC161㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	MA-325 IC161㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
$\overline{\text{CAP RVS}}$	MA-325 IC161㉞	$\overline{\text{O}}$	L			H	L	H/L	H	L	H	H	H/*5	H	H	L	H	H
T SENS	MA-325 IC161㊶	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-325 IC161㊷	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

∗1. Uncertainly.
∗2. “L” when erasing protection tab is bent, “H” when not bent.
∗3. Pulse of period in proportion to reel rotating speed.
∗4. Approx. 2 msec period “H” pulse.
∗5. Pulse at tape running.
∗6. Normally “L”. 2 msec period “H” pulse when tape top or tape end is detected.
∗7. When transition to UNLOADING direction: L.
When transition to LOADING direction: H.
When CAM motor is stopped: Hi-Z.
∗8. When RVS slow: mode 1; L.
When RVS slow: mode 2; L.
When RVS slow: mode 3; H.
When RVS slow: mode 4; L.

5-4. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-325 BOARD IC161)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	MA-325 IC161㊵	I	Normally “H”, “L” when service interruption is detected or restored
$\overline{\text{ASURA CS}}$	MA-325 IC161㊹	I	Chip select signal from timer microprocessor. V period “L” pulse
S IN	MA-325 IC161㊺	I	Serial communication data from timer microprocessor. V period “L” pulse
S OUT	MA-325 IC161㊻	O	Serial communication data to timer microprocessor. V period “L” pulse
$\overline{\text{S CLK}}$	MA-325 IC161㊼	I	Serial communication clock from timer microprocessor. V period “L” pulse

5-5. SYSTEM CONTROL – Hi-Fi AUDIO BLOCK INTERFACE (MA-325 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	PB • PAUSE
AU ENV	MA-325 IC161㊾	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-325 IC161㉛	O (O.D)	L	L	L	L	H	H	H	H	H	L	L
AF REC $\bar{P}$	MA-325 IC161②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	MA-325 IC161 ⑩⓪	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	MA-325 IC161㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 30 Hz 50% duty pulse approx. 5 msec delayed from RF SW P.

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTION (MA-325 BOARD IC161)

Pin No.	Pin Name	I/O	Function
1	RF SWP	O	RF switching pulse output
2	AF REC P	O	“L” output when hi-fi audio REC pause
3	N.C	–	Not used
4	QVD	O	Quasi VD pulse output
5	N.C	–	Not used
6	N.C	–	Not used
7	REC CTL	O	REC CTL signal output
8	CTL RESET	I	CTL reset (for check)
9	CAM	O	CAM motor control
10	N.C	–	Not used
11	N.C	–	Not used
12	N.C	–	Not used
13	NT JUDGE	–	Not used
14	MESECAM DET	–	Not used
15	CIN (REC PRF)	I	Erasing protection tab. Cassette in detection.
16	N.C	–	Not used
17	N.C	–	Not used
18	N.C	–	Not used
19	MODE 4	I	Mechanism section CAM encoder input (data4)
20	MODE 3	I	Mechanism section CAM encoder input (data3)
21	MODE 2	I	Mechanism section CAM encoder input (data2)
22	MODE 1	I	Mechanism section CAM encoder input (data1)
23	N.C	–	Not used
24	N.C	–	Not used
25	N.C	–	Not used
26	$\overline{\text{TV}}$/VTR	O	RF-output control
27	N.C	–	Not used
28	SDA 0	I/O	Video Audio (Normal & Hifi) block communication signal (IIC DATA)
29	N.C	–	Not used
30	SCL 0	O	Video Audio (Normal & Hifi) block communication signal (IIC CLOCK)
31	A MUTE	O	“A” Audio mute signal output
32	T/S LED	O	Top/End LED ON/OFF control
33	N.C	–	Not used
34	N.C	–	Not used
35	$\overline{\text{CAP STOP}}$	O	Capstain motor stop control
36	$\overline{\text{FULL ERASE}}$	O	Full erase head control
37	N.C	–	Not used
38	N.C	–	Not used
39	MP	I	Fixed to L
40	$\overline{\text{ASURA RESET}}$	I	System reset input
41	V ss	–	Ground
42	XTAL	–	System clock 16MHz
43	EXTAL	–	System clock 16MHz
44	$\overline{\text{ASURA CS}}$	I	S/S microcomputer chip signal
45	S IN	I	Serial communication signal (Data input)
46	S OUT	O	Serial communication signal (Data output)
47	$\overline{\text{S CLK}}$	O	Serial communication signal (Serial clock)
48	N.C	–	Not used
49	N.C	–	Not used
50	N.C	–	Not used

Pin No.	Pin Name	I/O	Function
51	N.C	–	Not used
52	AVSS	–	UNSW Ground
53	AVREF	–	A/D port reference input UNSW 5V
54	AVDD	–	UNSW 5V
55	NT PB SW	I	Not used (Pull up 5V)
56	AV ADJ	I	HiFi/RF switching adjustment mode
57	N.C	–	Not used
58	N.C	–	Not used
59	AF ENV	I	HiFi audio playback signal envelope
60	RF ENV	I	Video playback signal envelope
61	T SENS	I	Take up end sensor input
62	S SENS	I	Supply end sensor input
63	SREEL FG	I	S side reel FG input
64	TREEL FG	I	T side reei FG input
65	N.C	–	Not used
66	V SYNC	I	Composite sync input
67	$\overline{\text{PB CTL}}$	I	Playback CTL input
68	DRM PG	I	Drum PG input
69	DRM FG	I	Drum FG input
70	CAP FG	I	Capstan FG input
71	N.C	–	Not used
72	CAP RVS	O	Capstan reverse control H when Reverse
73	CAP DA	O	Capstan error D/A output
74	DRM DA	O	Drum error D/A output
75	N.C	–	Not used
76	N.C	–	Not used
77	REC CONT	I	Record count input
78	N.C	–	Not used
79	N.C	–	Not used
80	SO1	O	Signal for serial communication (data output)
81	SCK1	O	Signal for serial communication (clock)
82	N.C	–	Not used
83	N.C	–	Not used
84	CAP TRQ PWM	O	Capstan TRQ PWM output
85	N.C	–	Not used
86	N.C	–	Not used
87	N.C	–	Not used
88	VSS	–	Ground
89	VDD	–	5V
90	N.C	–	Not used
91	N.C	–	Not used
92	$\overline{\text{CTLHYS HIGHT}}$	O	CTL amp. Step control (Hi)
93	IN SEL1	O	LINE-INPUT selection control signal-1
94	N.C	–	Not used
95	N.C	–	Not used
96	AF REC	O	“H” output when Hifi audio REC
97	N.C	–	Not used
98	N.C	–	Not used
99	STEP PLS	O	Step pulse “H” when Capstan step driving
100	AF SWP	O	AF switching pulse output

5-7. TIMER/TUNER CONTROL MICROPROCESSOR PIN FUNCTION (FR-137 BOARD IC301)

Pin No.	Pin Name	I/O	Function
1	N.C	–	Not used (UNSW 5V)
2	$\overline{\text{POWER FAIL}}$	I	Power failure detect signal input
3	N.C	–	Not used (UNSW 5V)
4	SIRCS IN	I	Remote control signal (SIRCS) input
5	STEREO DET	I	STEREO detect signal
6	N.C	–	Not used
7	BUZZER	O	Buzzer signal output
8	N.C	–	Not used
9	N.C	–	Not used
10	$\overline{\text{SCK 0}}$	I	Serial communication signal (Serial clock)
11	SI 0	I	Serial communication signal (Data input)
12	SO 0	O	Serial communication signal (Data output)
13	SAP DET	I	SAP detect signal (Not used)
14	LANC IN	I	LANC signal input
15	LANC OUT	O	LANC signal output
16	A/D 0	I	Analog voltage (KEY) input
17	A/D 1	I	Analog voltage (KEY) input
18	A/D 2	I	Analog voltage (KEY) input
19	F MONO	O	F MONO signal
20	AFT	I	AFT (Auto fine tuning signal input)
21	H DET	I	H DET (TUNER H SYNC detect input)
22	A/D 6	I	Analog voltage (KEY) input
23	A/D 7	I	Analog voltage (KEY) input
24	AVDD	–	UNSW 5V
25	AV REF	I	A/D port reference input UNSW 5V
26	SCL 0	O	T BUS (clock)/IIC BUS (clock)
27	$\overline{\text{CG CS}}$	O	Character generator chip select signal
28	SDA 0	O	IIC BUS (data)
29	$\overline{\text{LED CS}}$	O	LED driver chip select signal
30	AVSS	–	Ground
31	EXTAL	O	System clock terminal (16MHz)
32	XTAL	I	System clock terminal (16MHz)
33	VSS	–	Ground
34	RST	I	RESET signal input
35	PLL CLK	O	TUNER PLL clock
36	PLL DATA	O	TUNER PLL data
37	PLL ENABLE	O	TUNER chip select
38	MAIN/SAP	O	MAIN/SAP select signal
39	N. C	–	Not used
40	TA MUTE	O	TUNER audio mute signal output
41	DMS 2	I	DMS fowared/reverse signal input
42	DMS 1	I	DMS fowared/reverse signal input
43	VFDP	–	VFDP
44	SEG1	O	Segment terminal 1
45	SEG2	O	Segment terminal 2
46	SEG3	O	Segment terminal 3
47	SEG4	O	Segment terminal 4
48	SEG5	O	Segment terminal 5
49	SEG6	O	Segment terminal 6
50	SEG7	O	Segment terminal 7

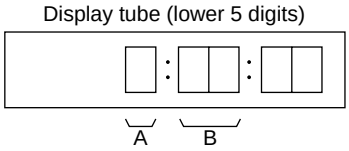
Pin No.	Pin Name	I/O	Function
51	SEG8	O	Segment terminal 8
52	SEG9	O	Segment terminal 9
53	SEG10	O	Segment terminal 10
54	SEG11	O	Segment terminal 11
55	SEG12	O	Segment terminal 12
56	SEG13	O	Segment terminal 13
57	SEG14	O	Segment terminal 14
58	SEG15	O	Segment terminal 15
59	SEG16	O	Segment terminal 16
60	N.C	–	Not used
61	N.C	–	Not used
62	N.C	–	Not used
63	N.C	–	Not used
64	N.C	–	Not used
65	N.C	–	Not used
66	GRID6	O	Grid terminal 6
67	GRID5	O	Grid terminal 5
68	GRID4	O	Grid terminal 4
69	GRID3	O	Grid terminal 3
70	GRID2	O	Grid terminal 2
71	GRID1	O	Grid terminal 1
72	VDD	–	UNSW5V
73	TX	I	Timer clock terminal (32KHz)
74	TEX	O	Timer clock terminal (32KHz)
75	NC/VPP	–	UNSW5V
76	$\overline{\text{ASURA CS}}$	O	S/S microcomputer chip signal
77	$\overline{\text{ASURA RESET}}$	O	System reset output
78	$\overline{\text{WC}}$	O	EEP ROM WRITE Control Signal
79	POWER CONT	O	Power supply control signal
80	CG V	I	Composite sync input

5-8. KOREAN STEREO PROCESSOR PIN FUNCTION (NK-11 BOARD IC1)

Pin. No.	Pin Name	I/O	Function
1	OUTL	O	Analog output left
2	OUTR	O	Analog output right
3	VDDA1	–	Analog power supply; DAC circuitry
4	VSSA1	–	Analog ground; DAC circuitry
5	VSSD1	–	Digital ground; DAC circuitry
6	VDDD1	–	Digital power supply; DAC circuitry
7	VSSD2	–	Digital ground; DSP part
8	VDDD2	–	Digital power supply; DSP part
9	TP2	I	Additional test pin 2; connected to ground for normal operation
10	NICAM	–	Not used
11	TP1	I	Additional test pin 1; connected to ground for normal operation
12	PCLK	–	Not used
13	ADDR1	–	Not used
14	Vtune	O	Tuning voltage output for crystal oscillator
15	XTALI	I	Crystal oscillator input
16	XTALO	O	Crystal oscillator output
17	TEST2	I	Test pin 2; connected to ground for normal operation
18	Iref	I	Resistor for reference current generation; front end circuitry
19	ADDR2	–	Not used
20	VSSA2	–	Analog ground; analog front end circuitry
21	VDDA2	–	Analog power supply; analog front end circuitry
22	TEST1	I	Test pin 1; connected to ground for normal operation
23	SIF2	I	Sound IF input 2
24	Vref1	I	Reference voltage; analog front end circuitry
25	SIF1	I	Sound IF input 1
26	CRST		Capacitor for power-on reset
27	VSSD3	–	Digital supply; front end circuitry
28	VDDD3	–	Digital supply; front end circuitry
29	SCL	I	Serial communication signal (IIC CLOCK)
30	SDA	I	Serial communication signal (IIC DATA)
31	SDO	–	Not used
32	WS	–	Not used
33	SCK	–	Not used
34	SYSCLK	–	Not used
35	VDDD4	–	Digital power supply; demodulator circuitry
36	VSSD4	–	Digital ground; demodulator circuitry
37	P1	–	Not used
38	MONOIN	–	Not used
39	EXTIR	I	External audio input right channel
40	EXTIL	I	External audio input left channel
41	Vref2	I	Analog reference voltage digital-to-analog converter and operational amplifiers
42	P2	–	Not used
43	VDDA3	–	Analog power supply; operational amplifiers
44	VSSA3	–	Analog ground; operational amplifiers

SECTION 6
ERROR CODES

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error.
The following provides description concerned.



A: EMG code ..... Table 6-1
B: Mechanism position (Encoder) ..... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.

Table 6-1. EMG Codes list

Code	Description
0	NO ERROR
1	CAM ENCODER ERROR, LOAD DIRECTION
2	CAM ENCODER ERROR, UNLOAD DIRECTION
3	T REEL ERROR
4	S REEL ERROR
5	CAPSTAN ERROR
6	DRUM ERROR
7	INITIALIZE ERROR
8	CASSETTE UNLOADING ERROR
9	RESERVED

Table 6-2. Mechanism position list

Code	Position	VTR status
0	NC	Other than the following positions
1	EJECT	EJECT (including POWER OFF)
2	CDOWN	Cassette at down position
3	ULDEND	Tape unloading end, DEW STOP
4	TLOAD	Tape loading
5	HCLEAN	Tape loading
6	LDEND	Tape loading end
7	RVS	RVS varying-speed play (including STILL, SLOW)
8	PR	For FWD, FWDP/RVS conversion
9	FWDP	FWD SLOW, FWD STILL
A	FWD	PB, FWD varying-speed play, STOP (DRUM ON)
B	STOP	STOP (DRUM OFF, POWER OFF)
C	FR	FF/REW

Display: □□
- Position when emergency occurred
- Position for which the mechanism destined

If the cam encoder alarm occurred when the mechanism was about to move forward, and it stopped at NC position,

Position for which mechanism destined = A (FWD)
Position when emergency occurred = 0 (NC),

accordingly, “A0” is displayed.

In case of emergency except cam encoder alarm or FL cassette compartment alarm, the cam motor does not run, and therefore if any emergency occurred at FWD position,

Position for which mechanism destined = A (FWD)
Position when emergency occurred = A (FWD),

accordingly, “AA” is displayed.

* NC code is output when the mechanism is moving between respective positions.

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustments on Page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

7-2. ADJUSTMENTS

2-1. EEP ROM INITIAL DATA INPUT

When EEP ROM (IC303 on FR-137 board) was changed, make it sure to input the data shown below and to perform both "3-3-1. RF Switching Position adjustment" and "3-4-1. 1. AF Switching Position adjustment" .

Input Method:

1) Connect the connector 4P (1-568-942-11) with JL322-JL325 on FR-137 board by a lead wire.

FR-137 board		Pin No
JL322	D GND	1
JL323	LANC OUT	2
JL324	LANC IN	3
JL325	D6V	4

2) Connect adjustment remote (J-6082-053-B) with the connector prepared at 1) by using LANC jig (J-6090-051-A).
3) Turn on the power.
4) Input data: 00 in adress: 00 on Page: 1.
5) Input data on Page 0 as following table.

Page		0	
Adress		01	02
Data	SLV-ED8KR	03	00
	SLV-ED9KR	03	01

6) Turn off the Power.
7) Disconnect the adjustment remote and LANC jig from the connector.
8) Disconnect the connector from FR-137 board.

7-3. ELECTRICAL ADJUSTMENTS

3-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

3-1-1. Instruments to be Used

1) Color TV
2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
3) NTSC pattern generator
4) Digital voltmeter
5) Audio level meter
6) Audio noise meter
7) Audio generator
8) Attenuator
9) Alignment tape
   Part Code: 8-192-605-32 KRV-51N2

3-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

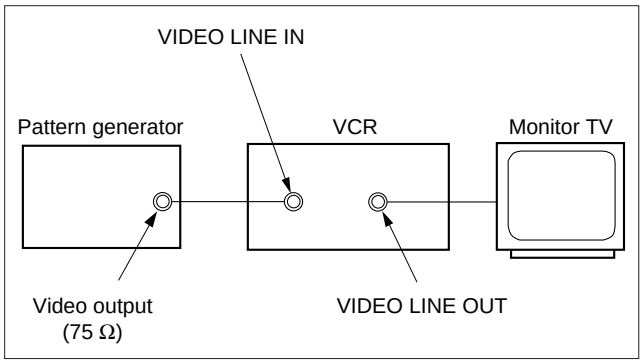


Fig. 7-3-1

3-1-3. Set-up of Adjustment

In this adjustment, NTSC pattern generator is connected with LINE input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30: 0.66. Fig. 7-3-2. shows video signals (color bars) used in adjusting the video section.

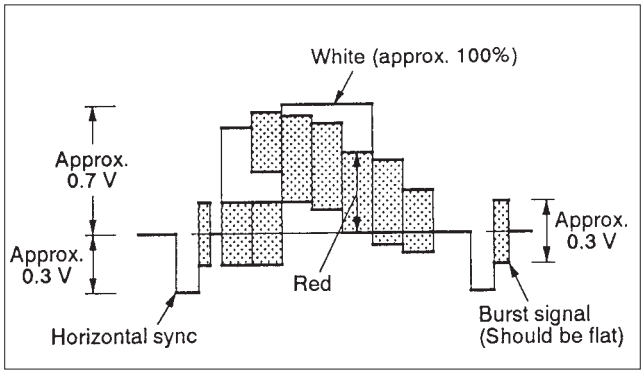


Fig. 7-3-2

3-1-4. Alignment Tapes [Alignment Tape (KRV-51N2)]

	Mode	Time	Video signal	Audio signal (HiFi/Normal)
1	SP	Seven minutes	Color bar	400 Hz
2	SP	Three minutes	Monoscope	
3	EP	Seven minutes	Color bar	
4	EP	Three minutes	Monoscope	

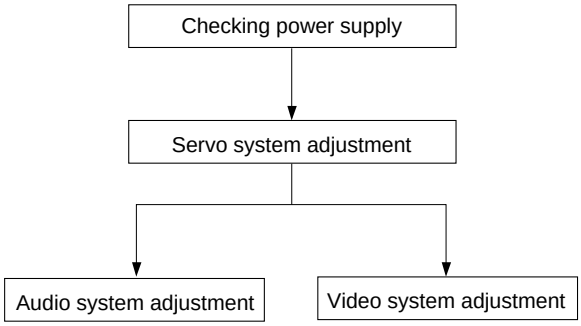
3-1-5. Specified I/O Level and Impedance

Input/Output Terminal

Video inputs LINE IN : phono jack
1 Vp-p, 75 Ω, unbalanced, sync negative
Audio inputs LINE IN : phono jacks
47 kW, –7.5 dBs (0 dBs = 0.775 Vrms)
More than 10 kW, –4 dBs
Video outputs LINE OUT: phono jack
1 Vp-p, 75 Ω, unbalanced, sync negative
Audio outputs LINE OUT: phono jacks
–7.5 dBs at load impedance 47 kΩ
Output impedance : less than 10 Ω

3-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



3-2. POWER SUPPLY ADJUSTMENT

3-2-1. Power Supply Check (SR-718 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmeter
–10 V check	
Measurement Point	Pin ⑨ of CN600
Specified Value	–10.3 ±0.8 V
+6 V check	
Measurement Point	Pin ⑦, ⑧ of CN600
Specified Value	5.9 ± 0.2 V
+13 V check	
Measurement Point	Pin ②, ③ of CN600
Specified Value	13.3 ± 0.5 V
+35 V check	
Measurement Point	Pin ① of CN600
Specified Value	38.0 ± 3.0 V

Checking Method:

1) Confirm that each voltage meets its specified value.

3-2-2. +6 V Adjustment (SR-718 BOARD)

Mode	REC or PB
Measuring Instrument	Digital voltmeter
Measurement Point	Pin ⑦, ⑧ of CN201
Adjusting Element	RV201
Specified Value	5.9 ± 0.2 V

3-3. SERVO SYSTEM ADJUSTMENT

3-3-1. RF Switching Position Adjustment (MA-325 Board)

Purpose:

Adjust the interval between A ch and B ch of tape playback output.

Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: Pin ② of CN501 CH2: Pin ③ of CN501 (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	6.5 ± 0.5 H (410 ± 32 µsec)

Adjusting Method:

1) Connect MA-325 board JS161 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Check appear "rFxx" on FL display.
3) Using the CHANNEL + and – buttons, adjust to 6.5 ± 0.5 H.
4) Press the PAUSE button.

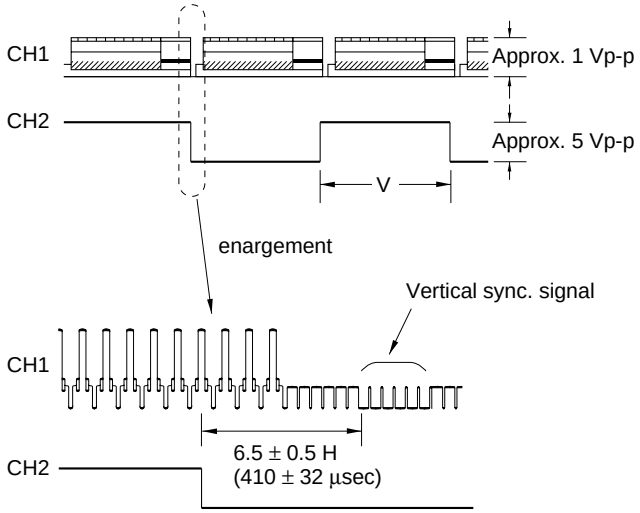


Fig. 7-3-3.

3-4. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

[Connection]

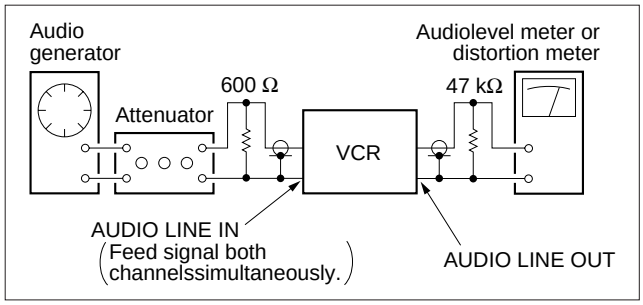


Fig. 7-3-4.

3-4-1. Hi-Fi Audio System Adjustment

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.
  INPUT SELECT switch ..... LINE
  AUDIO MONITOR ..... STEREO

[Adjustment Sequence]

1. AF Switching Position Adjustment
2. Frequency Responce Check
3. Overall Level Characteristic and Distortion Factor Check
4. Overall S/N Check

1. AF Switching Position Adjustment (MA-325 Board)

Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets. When it is out of order, noisy sound is increased and big noise is heard.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement point	CH2: Pin ① of CN341 CH1: Pin ③ of CN501
Measuring Instrument	Oscilloscope
Specified Value	Fig. 7-3-5

Adjusting Method:

1) Connect MA-325 board JS161 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Press the PAUSE button to activate the AF switching position adjustment mode.
3) Check appear "HFxx" on FL display.
4) Using the CHANNEL + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
5) Press the PAUSE button.
6) Press the EJECT button.

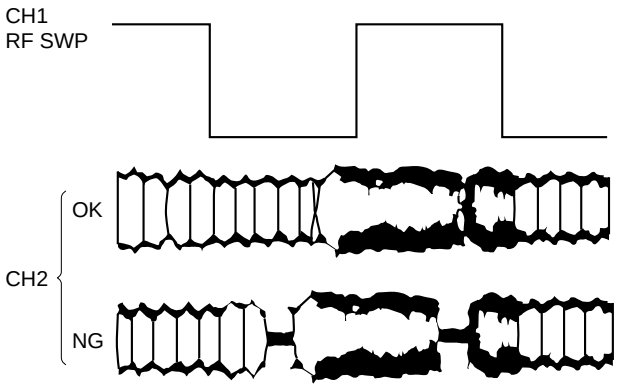


Fig. 7-3-5.

2. Frequency Responce Check

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP, EP mode)
Signal	400 Hz, –7.5 dBs 20 Hz, –7.5 dBs 20 kHz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0 ± 2 dB

Note: Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, –7.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –7.5 dBs.
4) Make recording.
5) Set an audio line input signal to 20 Hz and make recording.
6) Set an audio line input signal to 20 kHz and make recording.
7) Playback a recorded portion, and measure output levels at 400 Hz and 20 Hz and 20 kHz.
8) Confirm that the 20 Hz and 20 kHz playback output level within a range of the 400 Hz playback output level 0 ± 2 dB.

3. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 2 dBs Distortion factor: 1% or less

Confirmation Method:

1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ±2 dBs.
5) Confirm that a distortion factor is within 1%.

4. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–67.5 dBs or less

Confirmation Method:

1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –67.5 dBs.

3-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]

1. **ACE Head Adjustment**
2. **E-E Output Level Check**
3. **Frequency Responce Check**
4. **Overall Level Characteristic and Distortion Factor Check**
5. **Overall S/N Check**

1. ACE Head Adjustment

Refer to the service manual of VHS MECHANICAL ADJUSTMENT VI.

2. E-E Output Level Check

Purpose:

Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–7.5 ± 2 dBs

Confirmation Method:

1) Simultaneously input a signal of 400 Hz, –7.5 dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is –7.5 ± 2 dBs.

3. Frequency Responce Check

Purpose:

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –30.0 dBs 7 kHz, –30.0 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	1 ± 4 dB

Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, –30.0 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –30.0 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 1 ± 4 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 4 dBs Distortion factor: 4% or less

Confirmation Method:

1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ± 4 dBs.
5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–46.0 dBs or less

Confirmation Method:

1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –46.0 dBs.

3-5. VIDEO SYSTEM ADJUSTMENT

3-5-1. VCO Oscillation Frequency Adjustment (MA-325 Board)

Purpose:

Adjust to set the character position on the screen.

Mode	E-E
Signal	Color bar
Measurement point	Pin ㉖ of IC401
Measurement equipment	Oscilloscope (DC mode)
Adjusting Element	CT401
Specified value	2.75 ± 0.05 V

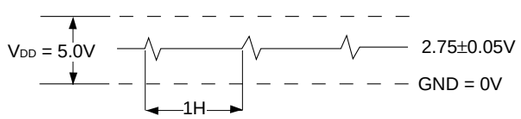
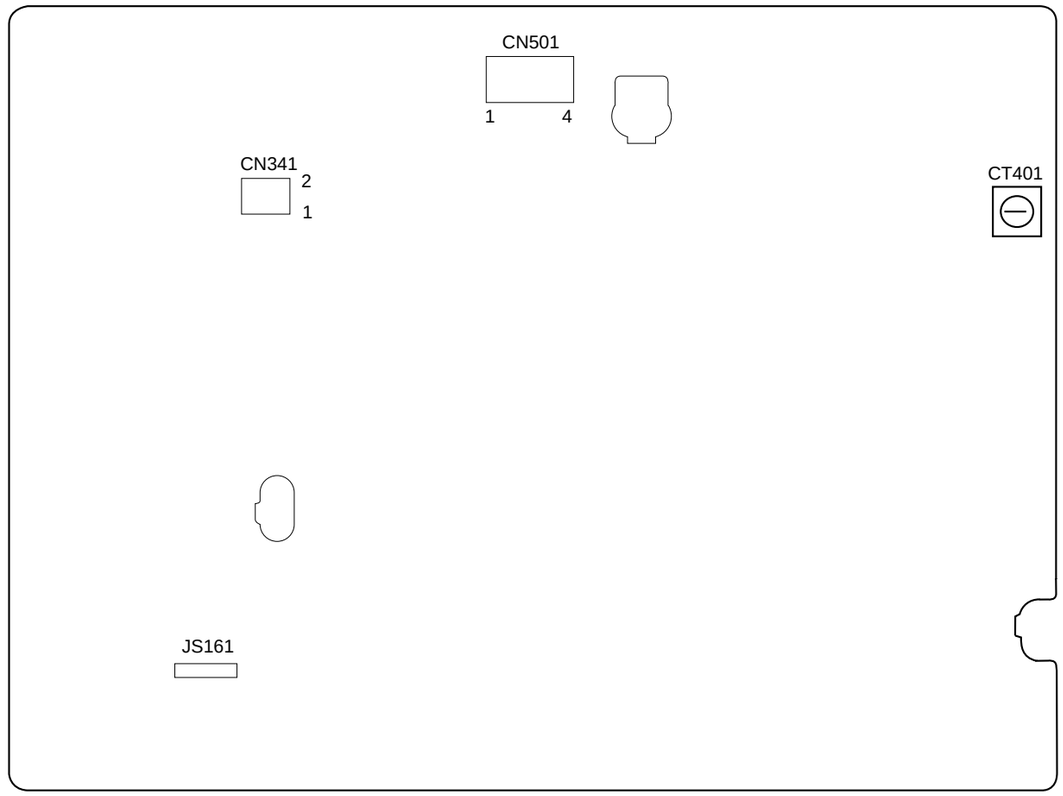


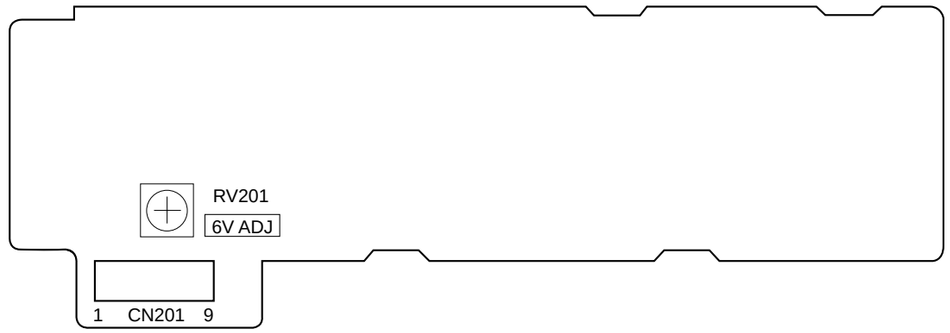
Fig. 7-3-6.

3-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-325 BOARD (Side A)



SR-718 BOARD (Side A)



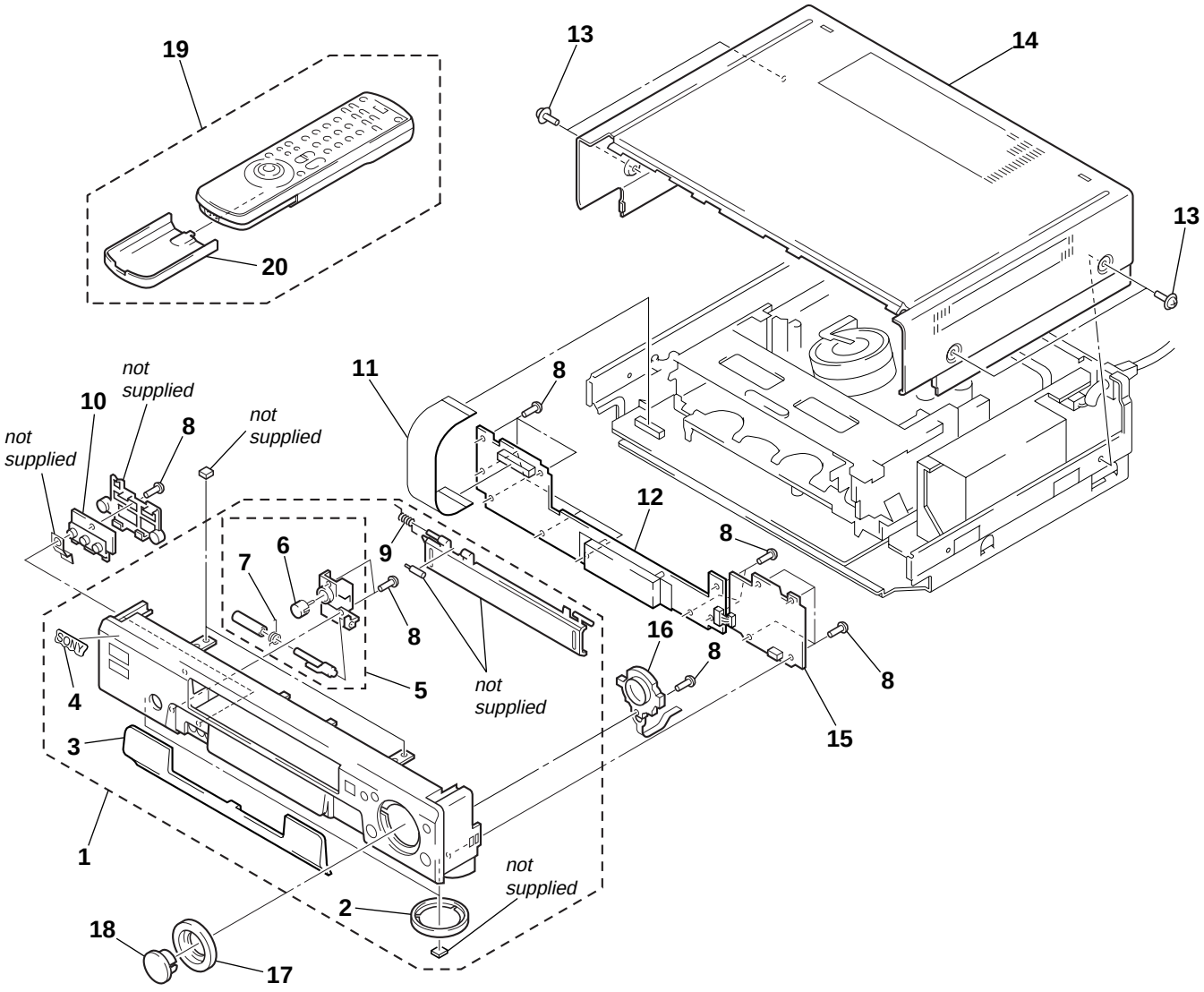
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

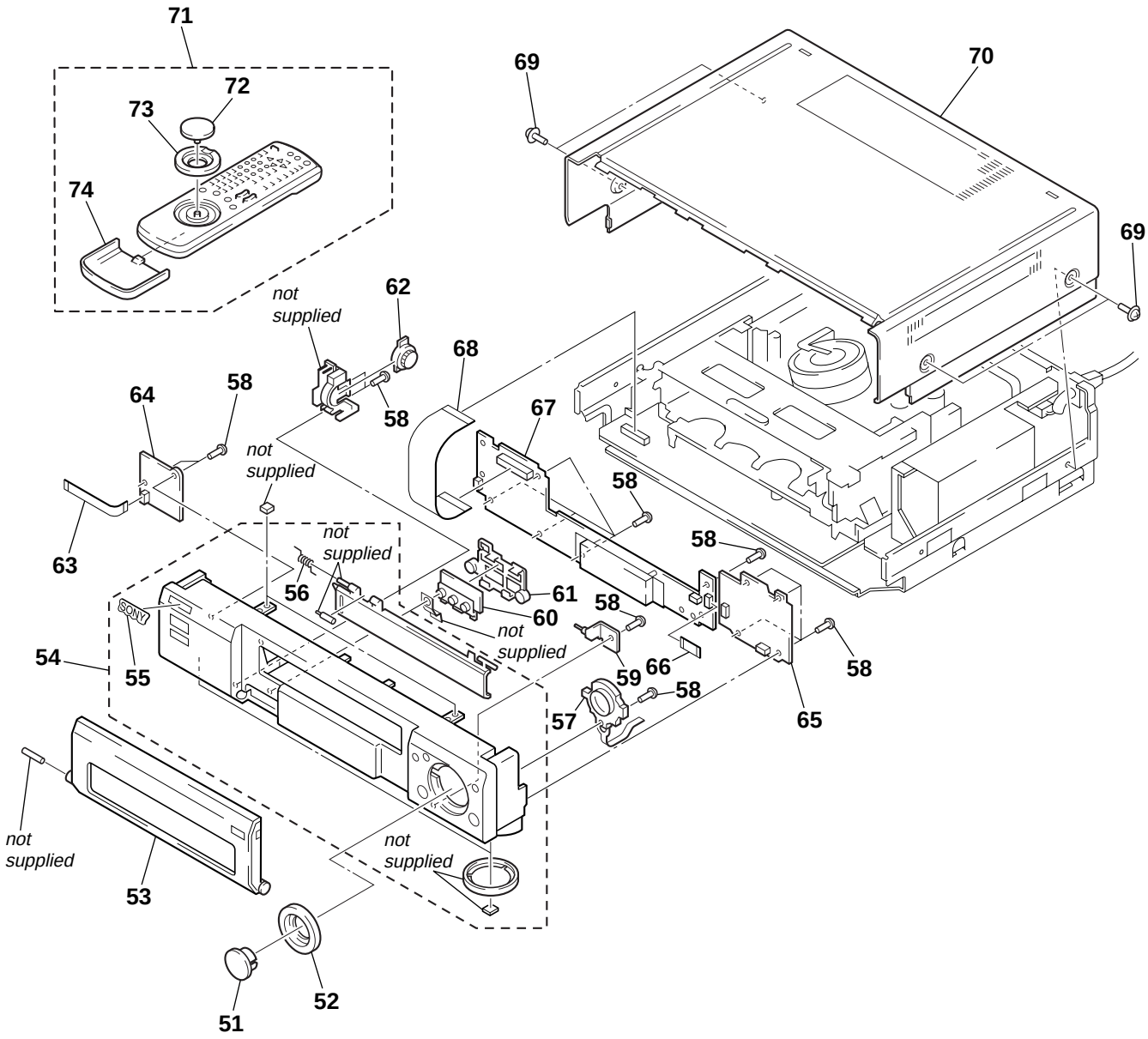
NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts Color Cabinet's Color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

8-1-1. FRONT PANEL AND CABINET ASSEMBLIES (ED8)



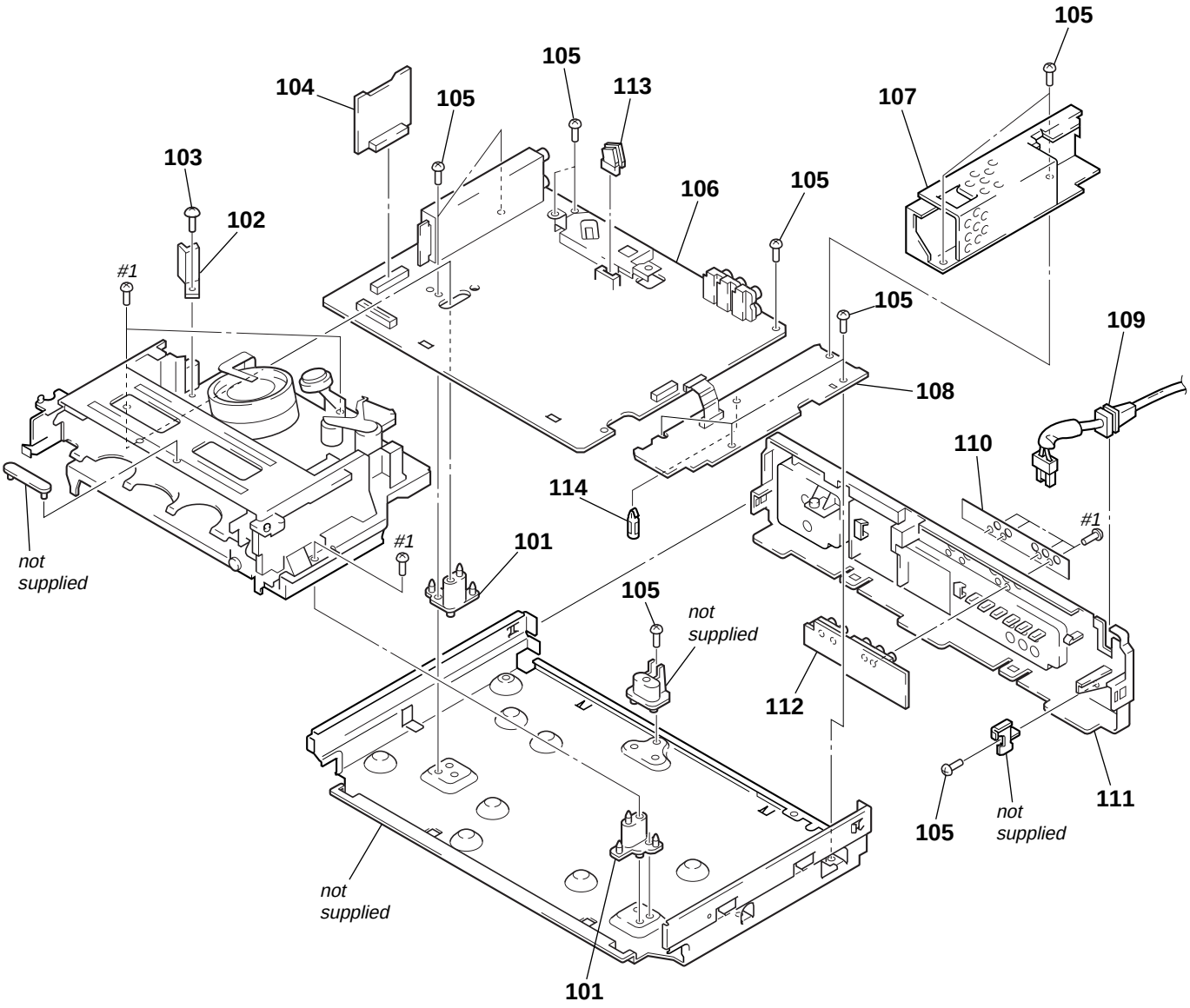
Ref. No.	Part No.	Description	Remark
1	X-3948-595-1	PANEL ASSY, FRONT	
* 2	3-977-160-01	INSULATOR	
3	X-3948-596-1	DOOR ASSY, FRONT	
4	3-943-995-01	EMBLEM (NO.5), SONY	
5	X-3948-597-1	LOCK ASSY, DOOR	
6	3-987-701-01	BUTTON, OPEN	
7	3-051-560-01	SPRING, DAMPER	
8	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
9	3-953-432-01	SPRING (GE), FL	
* 10	A-6791-628-A	IO-64 BOARD, COMPLETE	
11	1-783-849-11	CABLE, FLAT (FMF-30)	
* 12	A-6791-701-A	FR-137 BOARD, COMPLETE	
13	3-710-901-11	SCREW, TAPPING	
14	3-977-136-91	CASE, UPPER	
* 15	A-6791-626-A	DM-77 BOARD, COMPLETE	
16	1-762-844-21	SWITCH, ROTARY	
17	3-988-327-01	RING (M), JOG	
18	3-979-309-11	BUTTON (AV), CENTER	
19	1-475-615-11	COMMANDER, STANDARD (RMT-V246)	
20	3-709-128-01	COVER, BATTERY (for RMT-V246)	

8-1-2. FRONT PANEL AND CABINET ASSEMBLIES (ED9)



Ref. No.	Part No.	Description	Remark
51	3-979-309-01	BUTTON (AV), CENTER	
52	3-989-330-01	RING, JOG	
53	1-475-836-11	SWITCH BLOCK, CONTROL	
54	X-3948-845-1	PANEL ASSY, FRONT	
55	3-943-995-01	EMBLEM (NO.5), SONY	
56	3-953-432-01	SPRING (GE), FL	
57	1-762-844-21	SWITCH, ROTARY	
58	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
59	X-3948-901-1	PLATE (RIGHT) ASSY, FULCRUM	
* 60	A-6791-628-A	IO-64 BOARD, COMPLETE	
61	3-050-306-01	HOLDER, JACK	
62	3-973-975-31	DAMPER, OIL	
63	1-783-851-11	CABLE, FLAT (FFS-6)	
* 64	A-6791-655-A	SW-307 BOARD, COMPLETE	
* 65	A-6791-653-A	DM-77 BOARD, COMPLETE	
66	1-783-850-11	CABLE, FLAT (FFD-3)	
* 67	A-6791-698-A	FR-137 BOARD, COMPLETE	
68	1-783-849-11	CABLE, FLAT (FMF-30)	
69	3-710-901-11	SCREW, TAPPING	
70	3-977-136-91	CASE, UPPER	
71	1-475-612-21	COMMANDER, STANDARD (RMT-V244)	
72	3-972-850-01	BUTTON, FUNCTION (for RMT-V244)	
73	3-973-077-31	RING, CHANGE SPEED (for RMT-V244)	
74	3-709-126-01	COVER, BATTERY (for RMT-V244)	

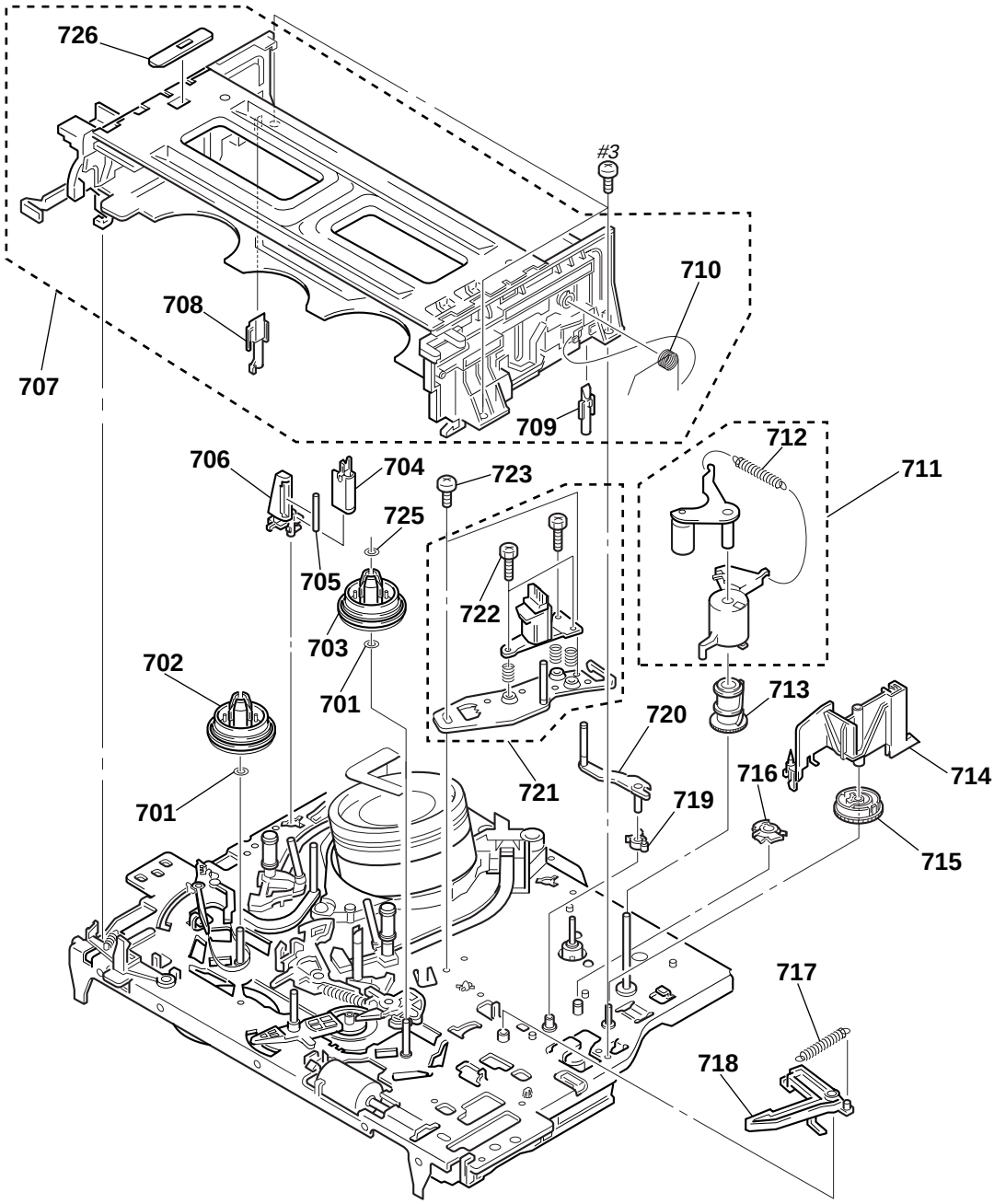
8-1-3. CHASSIS ASSEMBLY



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	3-979-314-01	BASE (R), MD	
102	X-3947-568-1	TC (N17S) ASSY	
103	3-979-112-01	SCREW SW (+) BVTP 3X10	
* 104	A-6791-591-A	NK-11 BOARD, COMPLETE	
105	3-970-608-21	SUMITITE (B3), +BV	
* 106	A-6791-679-A	MA-325 BOARD, COMPLETE (ED8)	
* 106	A-6796-659-A	MA-325 BOARD, COMPLETE (ED9)	
* 107	1-468-311-11	POWER BLOCK (SR-718)	
* 108	A-6791-700-A	PS-414 BOARD, COMPLETE	
⚠109	1-782-752-11	CORD, POWER	
110	3-987-913-52	PLATE, REAR JACK B	
111	3-977-139-91	PANEL, REAR	
* 112	A-6791-642-A	RJ-79 BOARD, COMPLETE	
113	1-766-725-11	CONNECTOR, BOARD TO BOAR 5P	
114	3-682-057-11	SPACER (SMALL)	

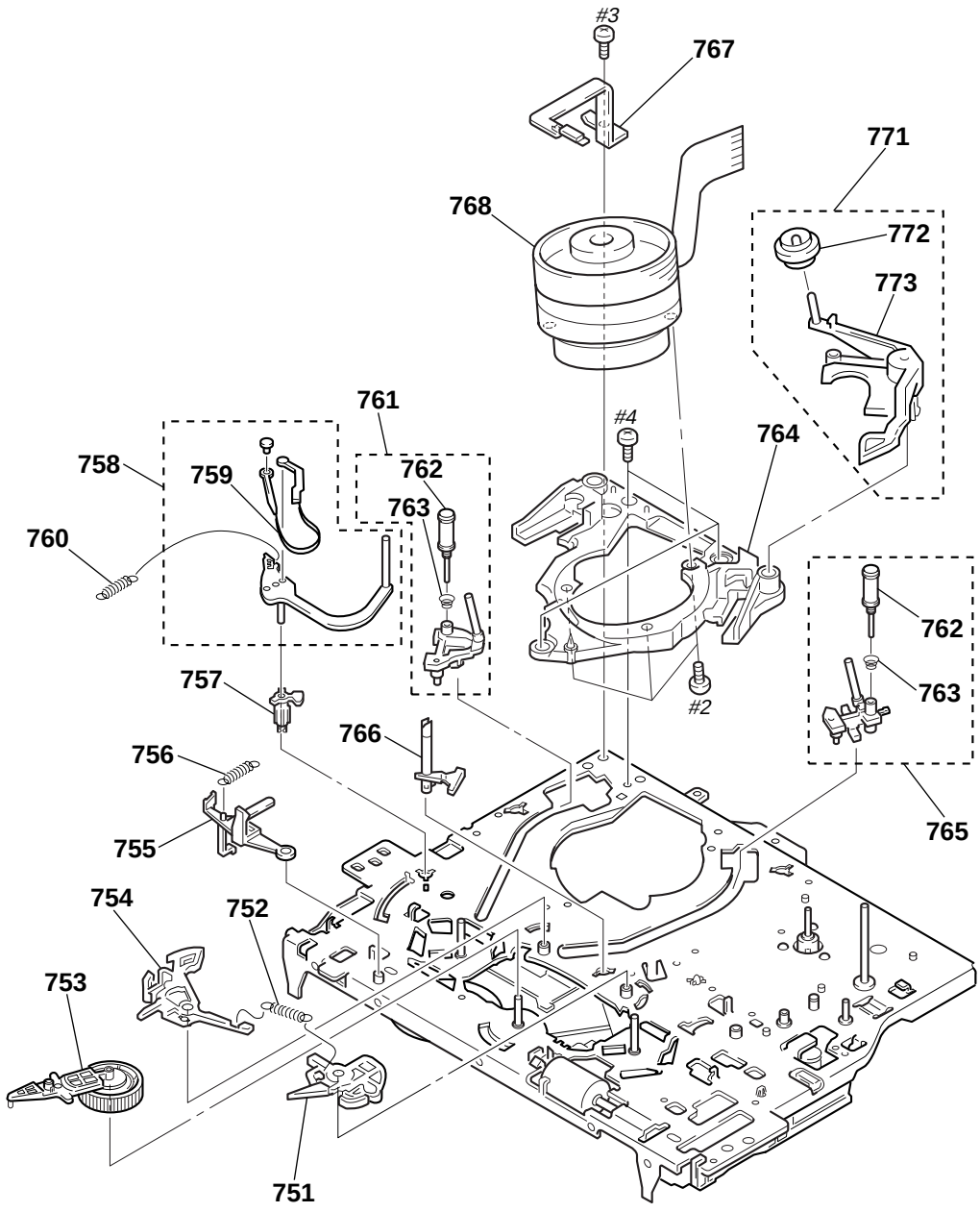
8-1-4. MECHANISM CHASSIS ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-B	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	

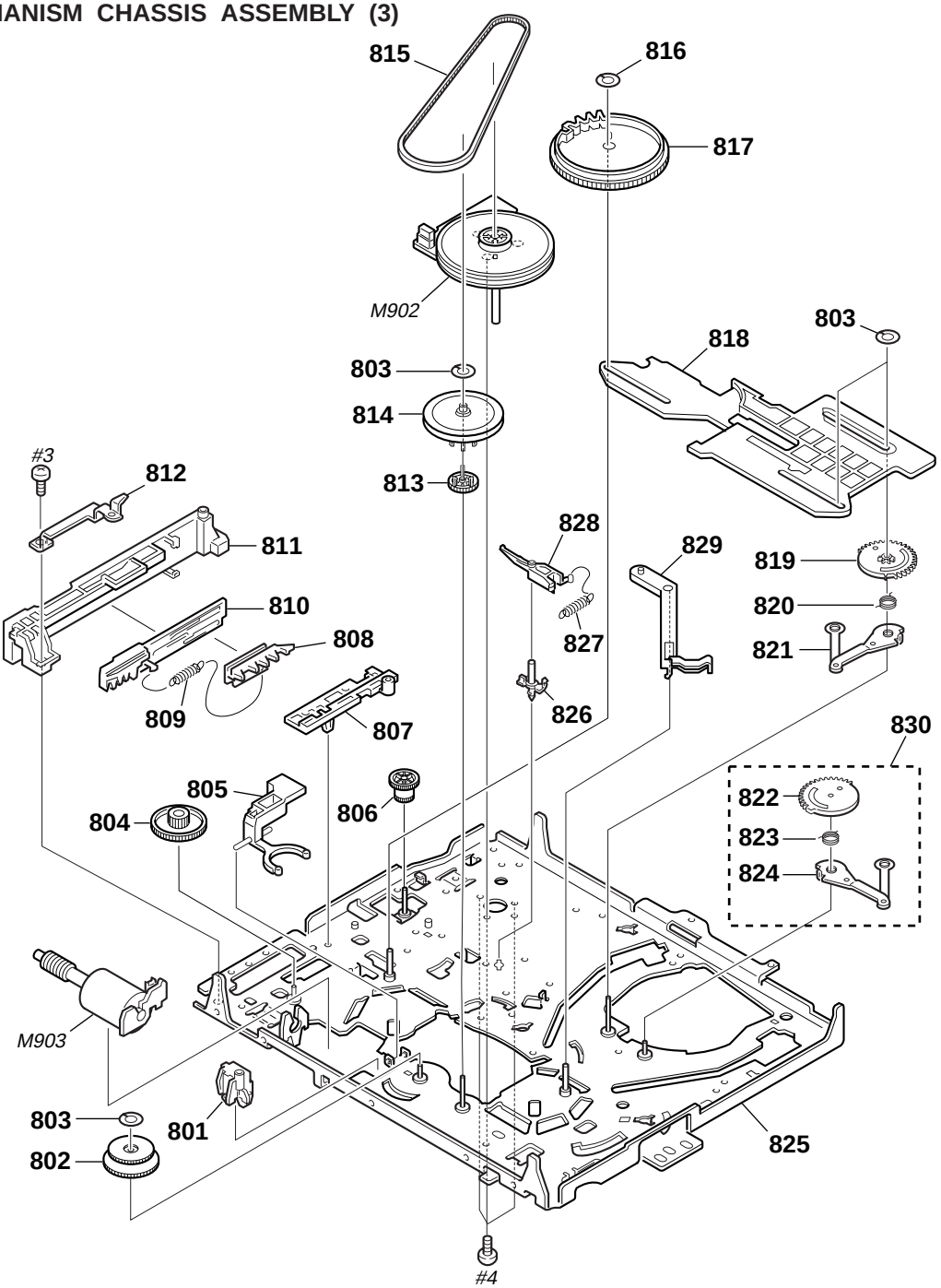
Ref. No.	Part No.	Description	Remark
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3X8	
725	3-977-443-01	WASHER, STOPPER	
726	3-987-560-02	PLATE, TOP, FL	

8-1-5. MECHANISM CHASSIS ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark
751	X-3947-581-1	BRAKE ASSY,MAIN (T)	
752	3-977-462-01	SPRING, EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN (S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	8-839-044-02	DRUM ASSY DZH-94A/ZRP	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	

8-1-6. MECHANISM CHASSIS ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remark
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING (T)	
822	3-977-451-01	GEAR, LOADING (S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING (S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING(S)	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

8-2. ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH
- Not all of the parts for POWER BLOCK (SR-718) are listed.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6791-653-A	DM-77 BOARD, COMPLETE (ED9)			
*	A-6791-626-A	DM-77 BOARD, COMPLETE (ED8)			
		**********			
					(Ref.No.1,000 Series)
		< CAPACITOR >			
C450	1-124-584-00	ELECT	100uF	20%	10V
C451	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN451	1-784-484-11	CONNECTOR, FFC/FPC 5P			
CN452	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P (ED8)			
CN453	1-691-066-21	HOUSING, CONNECTOR 7P (ED9)			
		< DIODE >			
D459	8-719-056-06	DIODE	SLR-342DCT31 (JOG)		
		< JUMPER RESISTOR >			
JR451	1-216-296-00	METAL CHIP	0	5%	1/8W
JR452	1-216-295-00	METAL CHIP	0	5%	1/10W
JR454	1-216-296-00	METAL CHIP	0	5%	1/8W
JR455	1-216-296-00	METAL CHIP	0	5%	1/8W
		< TRANSISTOR >			
Q450	8-729-421-19	TRANSISTOR	UN2213		
		< RESISTOR >			
R459	1-216-033-00	METAL CHIP	220	5%	1/10W
R464	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R467	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R468	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R469	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R470	1-216-073-00	METAL CHIP	10K	5%	1/10W
R471	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R472	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R473	1-216-073-00	METAL CHIP	10K	5%	1/10W
R474	1-216-073-00	METAL CHIP	10K	5%	1/10W
R475	1-216-073-00	METAL CHIP	10K	5%	1/10W
R476	1-216-073-00	METAL CHIP	10K	5%	1/10W
		< SWITCH >			
S451	1-762-196-21	SWITCH, TACT (REC)			
S453	1-762-196-21	SWITCH, TACT (REW)			
S457	1-762-196-21	SWITCH, TACT (FF)			
S458	1-762-196-21	SWITCH, TACT (PAUSE)			
S459	1-762-196-21	SWITCH, TACT (JOG)			
*	A-6791-698-A	FR-137 BOARD, COMPLETE (ED9)			
*	A-6791-701-A	FR-137 BOARD, COMPLETE (ED8)			
		**********			
					(Ref.No.1,000 Series)
	3-987-885-01	HOLDER (P6), FL			
		< BUZZER >			
BZ301	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C301	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C302	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C303	1-163-104-00	CERAMIC CHIP	30PF	5%	50V
C304	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C306	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C307	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C308	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C309	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C310	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C311	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C312	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C313	1-126-935-11	ELECT	470uF	20%	6.3V
C314	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C315	1-126-935-11	ELECT	470uF	20%	6.3V
C316	1-126-916-11	ELECT	1000uF	20%	6.3V
C317	1-104-905-11	CAPACITOR	0.22F		5.5V
C334	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C335	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
					(ED9)
C336	1-162-306-11	CERAMIC	0.01uF	20%	16V
C337	1-162-306-11	CERAMIC	0.01uF	20%	16V
C338	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
					(ED9)
C339	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
					(ED9)
C340	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
					(ED8)

Ref. No.	Part No.	Description			Remark
C341	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
CN302	1-691-036-21	HOUSING, CONNECTOR 4P (ED9)			
* CN303	1-695-352-11	PIN, CONNECTOR (PC BOARD) 29P			
* CN307	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P (ED8)			
CN308	1-784-484-11	CONNECTOR, FFC/FPC 5P (ED9)			
CN309	1-691-066-21	HOUSING, CONNECTOR 7P (ED9)			
		< DIODE >			
D307	8-719-109-93	DIODE RD6.2ES-B2			
D308	8-719-950-60	DIODE MPG06D-6052PKG23			
D309	8-719-950-60	DIODE MPG06D-6052PKG23			
D311	8-719-017-09	DIODE 02DZ6.2-TPH3			
D318	8-719-056-07	DIODE SLR-342MCT31 (POWER) (ED8)			
D319	8-719-017-09	DIODE 02DZ6.2-TPH3			
		< IC >			
IC301	8-752-899-94	IC CXP82940-039Q			
IC302	8-759-248-87	IC MM1256XF-BE			
IC303	8-759-432-32	IC ST24W04FM6TR			
IC304	8-749-011-05	IC GP1U28X (ED8)			
		< JUMPER RESISTOR >			
JR301	1-216-296-00	METAL CHIP	0	5%	1/8W
JR302	1-216-296-00	METAL CHIP	0	5%	1/8W
JR304	1-216-295-00	METAL CHIP	0	5%	1/10W
JR306	1-216-296-00	METAL CHIP	0	5%	1/8W
JR307	1-216-295-00	METAL CHIP	0	5%	1/10W
JR308	1-216-295-00	METAL CHIP	0	5%	1/10W
JR309	1-216-296-00	METAL CHIP	0	5%	1/8W
JR310	1-216-296-00	METAL CHIP	0	5%	1/8W
JR311	1-216-296-00	METAL CHIP	0	5%	1/8W
JR315	1-216-296-00	METAL CHIP	0	5%	1/8W
JR316	1-216-295-00	METAL CHIP	0	5%	1/10W
JR317	1-216-296-00	METAL CHIP	0	5%	1/8W
JR318	1-216-295-00	METAL CHIP	0	5%	1/10W
JR319	1-216-296-00	METAL CHIP	0	5%	1/8W
JR320	1-216-295-00	METAL CHIP	0	5%	1/10W
JR321	1-216-296-00	METAL CHIP	0	5%	1/8W
JR322	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L301	1-414-938-21	INDUCTOR	47uH		
L302	1-414-938-21	INDUCTOR	47uH (ED9)		
L303	1-414-932-21	INDUCTOR	4.7uH		
L304	1-414-932-21	INDUCTOR	4.7uH		
		< FLUORECENT INDICATOR >			
ND320	1-517-734-31	TUBE, FLUORESCENT INDICATOR (ED9)			
ND320	1-517-734-21	TUBE, FLUORESCENT INDICATOR (ED8)			
		< TRANSISTOR >			
Q300	8-729-421-19	TRANSISTOR	UN2213 (ED8)		
		< RESISTOR >			
R301	1-216-025-91	RES,CHIP	100	5%	1/10W
R302	1-216-295-00	METAL CHIP	0	5%	1/10W
R303	1-249-417-11	CARBON	1K	5%	1/4W F
R304	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R305	1-216-049-00	METAL CHIP	1K	5%	1/10W
R306	1-216-089-00	METAL CHIP	47K	5%	1/10W
R307	1-216-049-00	METAL CHIP	1K	5%	1/10W
R308	1-216-113-00	METAL CHIP	470K	5%	1/10W
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W
R310	1-216-073-00	METAL CHIP	10K	5%	1/10W
R311	1-216-295-00	METAL CHIP	0	5%	1/10W
R312	1-216-198-91	RES,CHIP	1K	5%	1/8W
R313	1-249-417-11	CARBON	1K	5%	1/4W F
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W
R315	1-216-095-00	METAL CHIP	82K	5%	1/10W
R316	1-216-041-00	METAL CHIP	470	5%	1/10W
R317	1-247-807-31	CARBON	100	5%	1/4W
R318	1-247-807-31	CARBON	100	5%	1/4W
R319	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R320	1-216-041-00	METAL CHIP	470	5%	1/10W
R321	1-216-025-91	RES,CHIP	100	5%	1/10W
R322	1-216-025-91	RES,CHIP	100	5%	1/10W
R323	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R324	1-249-417-11	CARBON	1K	5%	1/4W F
R325	1-216-049-00	METAL CHIP	1K	5%	1/10W
R326	1-216-049-00	METAL CHIP	1K	5%	1/10W
R327	1-216-095-00	METAL CHIP	82K	5%	1/10W
R328	1-216-113-00	METAL CHIP	470K	5%	1/10W
R329	1-216-190-00	RES,CHIP	470	5%	1/8W (ED9)
R329	1-216-296-00	METAL CHIP	0	5%	1/8W (ED8)
R334	1-216-073-00	METAL CHIP	10K	5%	1/10W
R337	1-216-295-00	METAL CHIP	0	5%	1/10W (ED8)
R338	1-216-029-00	METAL CHIP	150	5%	1/10W (ED8)
R340	1-208-813-11	RES,CHIP	20K	0.50%	1/10W (ED8)
R341	1-208-812-11	RES,CHIP	18K	0.50%	1/10W (ED8)
R342	1-216-083-00	METAL CHIP	27K	5%	1/10W (ED8)
R343	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (ED8)
R347	1-216-095-00	METAL CHIP	82K	5%	1/10W
		< SWITCH >			
S300	1-762-196-21	SWITCH, TACT (POWER) (ED8)			
S301	1-762-196-21	SWITCH, TACT (CHANNEL-) (ED8)			
S302	1-762-196-21	SWITCH, TACT (SP/EP) (ED8)			
S303	1-762-196-21	SWITCH, TACT (CHANNEL+) (ED8)			
S304	1-762-196-21	SWITCH, TACT (INPUT SELECT) (ED8)			
S305	1-762-196-21	SWITCH, TACT (ONE TOUCH TUNING) (ED8)			
S306	1-762-196-21	SWITCH, TACT (EASY TIMER) (ED8)			
S309	1-762-196-21	SWITCH, TACT (EJECT)			
		< VIBRATOR >			
X301	1-579-463-11	VIBRATOR, CRYSTAL (32.768kHz)			
X302	1-579-930-12	VIBRATOR, CERAMIC (16MHz)			

Ref. No.	Part No.	Description			Remark
*	A-6791-628-A	IO-64 BOARD, COMPLETE			
		**********			
		(Ref.No.1,000 Series)			
		< CONNECTOR >			
* CN480	1-568-943-11	PIN, CONNECTOR 5P			
		< JACK >			
CNJ480	1-774-509-11	JACK, PIN 3P (LINE-2 IN)			
		< DIODE >			
D480	8-719-109-93	DIODE RD6.2ES-B2			
D481	8-719-108-12	DIODE RD9.1E-W			
D482	8-719-017-09	DIODE 02DZ6.2-TPH3			
D490	8-719-108-12	DIODE RD9.1E-W			
D491	8-719-108-12	DIODE RD9.1E-W			
		< JUMPER RESISTOR >			
JR480	1-216-296-00	METAL CHIP	0	5%	1/8W
JS490	1-216-295-00	METAL CHIP	0	5%	1/10W
< RESISTOR >					
R480	1-216-022-00	METAL CHIP	75	5%	1/10W
R481	1-216-295-00	METAL CHIP	0	5%	1/10W
R490	1-216-295-00	METAL CHIP	0	5%	1/10W
R491	1-216-295-00	METAL CHIP	0	5%	1/10W
*	A-6791-679-A	MA-325 BOARD, COMPLETE (ED8)			
*	A-6796-659-A	MA-325 BOARD, COMPLETE (ED9)			
		**********			
		(Ref.No.2,000 Series)			
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
		< CAPACITOR >			
C002	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C004	1-126-160-11	ELECT	1uF	20%	50V
C022	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C023	1-124-589-11	ELECT	47uF	20%	16V
C025	1-126-160-11	ELECT	1uF	20%	50V
C026	1-124-584-00	ELECT	100uF	20%	10V
C027	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C071	1-124-589-11	ELECT	47uF	20%	16V
C081	1-124-589-11	ELECT	47uF	20%	16V
C082	1-137-462-11	FILM	0.018uF	5%	100V
C083	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C084	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C091	1-124-589-11	ELECT	47uF	20%	16V
C092	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C094	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C095	1-104-697-11	FILM	0.047uF	5%	100V
C100	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-128-057-11	ELECT	330uF	20%	6.3V
C109	1-124-589-11	ELECT	47uF	20%	16V
C113	1-124-589-11	ELECT	47uF	20%	16V
C114	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C131	1-128-499-11	ELECT	220uF	20%	16V

Ref. No.	Part No.	Description			Remark
C133	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C134	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C141	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C143	1-137-372-11	FILM	0.022uF	5%	50V
C144	1-137-441-11	FILM	0.027uF	5%	50V
C145	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C163	1-124-589-11	ELECT	47uF	20%	16V
C164	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C165	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C166	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C167	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C168	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C169	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C202	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C203	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C205	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C206	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C207	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C208	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C209	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C211	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C212	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C213	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C214	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C215	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C216	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C217	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C219	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C220	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C221	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C222	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C223	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C224	1-124-248-00	ELECT	22uF	20%	35V
C226	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C227	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C228	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C230	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C231	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C235	1-126-157-11	ELECT	10uF	20%	16V
C237	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C238	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C239	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C240	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C241	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C243	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C244	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C246	1-124-589-11	ELECT	47uF	20%	16V
C247	1-126-157-11	ELECT	10uF	20%	16V
C248	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C251	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C252	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C253	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C254	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C258	1-163-249-11	CERAMIC CHIP	82PF	5%	50V
C261	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C265	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C301	1-117-720-11	CERAMIC CHIP	4.7uF		10V

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Ref. No.	Part No.	Description			Remark
C302	1-124-589-11	ELECT	47uF	20%	16V
C305	1-126-160-11	ELECT	1uF	20%	50V
C306	1-126-160-11	ELECT	1uF	20%	50V
C307	1-126-157-11	ELECT	10uF	20%	16V
C308	1-124-589-11	ELECT	47uF	20%	16V
C309	1-126-163-11	ELECT	4.7uF	20%	50V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C311	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C312	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C313	1-126-157-11	ELECT	10uF	20%	16V
C314	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V
C318	1-124-589-11	ELECT	47uF	20%	16V
C340	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C342	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C346	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C350	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C352	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C353	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C357	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C358	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C359	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C361	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C362	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C363	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C364	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C365	1-126-160-11	ELECT	1uF	20%	50V
C366	1-126-160-11	ELECT	1uF	20%	50V
C369	1-126-157-11	ELECT	10uF	20%	16V
C370	1-126-157-11	ELECT	10uF	20%	16V
C371	1-126-157-11	ELECT	10uF	20%	16V
C372	1-126-157-11	ELECT	10uF	20%	16V
C373	1-126-157-11	ELECT	10uF	20%	16V
C374	1-126-160-11	ELECT	1uF	20%	50V
C375	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C376	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C377	1-126-967-11	ELECT	47uF	20%	50V
C378	1-126-964-11	ELECT	10uF	20%	50V
C379	1-126-961-11	ELECT	2.2uF	20%	50V
C380	1-126-964-11	ELECT	10uF	20%	50V
C381	1-126-967-11	ELECT	47uF	20%	50V
C382	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C383	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C384	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C385	1-126-933-11	ELECT	100uF	20%	16V
C386	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C391	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C401	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C402	1-124-589-11	ELECT	47uF	20%	16V
C403	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C404	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C405	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C406	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C407	1-130-481-00	MYLAR	0.0068uF	5%	50V
C408	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C409	1-137-372-11	FILM	0.022uF	5%	50V
C410	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C411	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C412	1-117-720-11	CERAMIC CHIP	4.7uF	10V	

Ref. No.	Part No.	Description			Remark
C414	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C415	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C416	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C417	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C501	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C502	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C503	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C504	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C505	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C506	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C507	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C508	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C509	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C510	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C511	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C512	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C513	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C514	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C515	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C516	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C517	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C518	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C519	1-124-584-00	ELECT	100uF	20%	10V
C520	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C521	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C522	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C523	1-124-584-00	ELECT	100uF	20%	10V
C524	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C526	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C527	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C529	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C703	1-104-664-11	ELECT	47uF	20%	16V
C709	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C710	1-126-963-11	ELECT	4.7uF	20%	50V
C712	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C713	1-126-933-11	ELECT	100uF	20%	16V
C714	1-126-933-11	ELECT	100uF	20%	16V
C715	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C716	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C717	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C718	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C719	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C720	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C721	1-126-767-11	ELECT	1000uF	20%	16V
C722	1-104-664-11	ELECT	47uF	20%	16V
C751	1-126-964-11	ELECT	10uF	20%	50V
C752	1-126-964-11	ELECT	10uF	20%	50V
C753	1-104-664-11	ELECT	47uF	20%	16V
C754	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C755	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C756	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C902	1-126-935-11	ELECT	470uF	20%	6.3V
C904	1-104-664-11	ELECT	47uF	20%	16V
C906	1-126-960-11	ELECT	1uF	20%	50V
C907	1-126-960-11	ELECT	1uF	20%	50V
C911	1-126-934-11	ELECT	220uF	20%	16V
		< CONNECTOR >			
CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P			
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P			

Ref. No.	Part No.	Description	Remark
* CN103	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
* CN105	1-695-352-11	PIN, CONNECTOR (PC BOARD) 29P	
CN161	1-506-468-11	PIN, CONNECTOR 3P	
CN162	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN301	1-506-469-11	PIN, CONNECTOR 4P	
CN302	1-506-468-11	PIN, CONNECTOR 3P	
* CN341	1-560-890-00	PIN, CONNECTOR 2P	
CN423	1-766-278-11	PIN, CONNECTOR (PC BOARD) 5P	
* CN501	1-560-892-00	PIN, CONNECTOR 4P	
CN502	1-784-492-11	CONNECTOR, FFC/FPC 13P	
CN751	1-691-170-11	PIN, CONNECTOR 13P	
* CN901	1-568-955-11	PIN, CONNECTOR 6P	
		< JACK >	
CNJ901	1-779-011-11	JACK, PIN 6P (LINE-1 IN/OUT)	
		< TRIMMER >	
CT401	1-141-334-11	CAP, TRIMMER 30PF (VCO ADJ)	
		< DIODE >	
D102	8-719-048-26	DIODE GL528V1	
D103	8-719-200-82	DIODE 11ES2	
D104	8-719-200-82	DIODE 11ES2	
D130	8-719-200-82	DIODE 11ES2	
D141	8-719-911-19	DIODE 1SS119	
D161	8-719-200-82	DIODE 11ES2	
D360	8-719-109-93	DIODE RD6.2ES-B2	
D401	8-719-911-19	DIODE 1SS119	
D402	8-719-911-19	DIODE 1SS119	
D403	8-719-911-19	DIODE 1SS119	
D704	8-719-150-92	DIODE RD33ES-T1B	
D750	8-719-911-19	DIODE 1SS119	
D902	8-719-109-93	DIODE RD6.2ES-B2	
D903	8-719-911-19	DIODE 1SS119	
		< IC >	
IC001	8-759-100-93	IC uPC393G2	
IC021	8-759-438-83	IC BA6305F-E2	
IC071	8-759-499-30	IC BA7755AF-E2	
IC101	8-759-702-02	IC NJM062M	
IC130	8-759-481-46	IC LB1943	
IC161	8-752-896-86	IC CXP87948-013Q	
IC201	8-759-488-74	IC LA71534M-MPB	
IC202	8-759-439-51	IC LC89978M-TE-L	
IC340	8-759-486-92	IC LA7256	
IC360	8-759-486-64	IC TDA9615H/N1,557	
IC401	8-759-539-54	IC LC74761M-9716-TLM	
IC501	8-759-352-17	IC HA118195NT	
IC901	8-759-454-62	IC uPC4558G2-E2	
		< JUMPER RESISTOR >	
JR001	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR002	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR003	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR004	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR005	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR006	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR007	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR008	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR009	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR010	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR011	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR012	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR013	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR014	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR015	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR016	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR017	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR018	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR019	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR020	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR021	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR201	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR202	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR203	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR204	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR205	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR206	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR207	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR208	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR209	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR210	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR211	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR212	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR213	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR214	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR215	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR216	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR217	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR218	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR219	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR220	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR221	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR222	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR223	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR224	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR225	1-216-296-00	METAL CHIP 0 5% 1/8W	
JS213	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS215	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS709	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS711	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS712	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS713	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS716	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< COIL >	
L001	1-414-940-21	INDUCTOR 100uH	
L071	1-414-940-21	INDUCTOR 100uH	
L081	1-414-940-21	INDUCTOR 100uH	
L091	1-410-687-11	INDUCTOR 1.2mH	
L160	1-414-934-21	INDUCTOR 10uH	
L202	1-414-946-21	INDUCTOR 39uH	
L203	1-414-946-21	INDUCTOR 39uH	
L209	1-414-942-21	INDUCTOR 220uH	
L301	1-414-940-21	INDUCTOR 100uH	
L341	1-414-940-21	INDUCTOR 100uH	
L402	1-414-940-21	INDUCTOR 100uH	
L403	1-410-506-11	INDUCTOR 5.6uH	
L404	1-414-936-21	INDUCTOR 22uH	
L501	1-414-940-21	INDUCTOR 100uH	

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Ref. No.	Part No.	Description			Remark
L502	1-414-940-21	INDUCTOR	100uH		
L702	1-414-930-21	INDUCTOR	2.2uH		
L703	1-414-930-21	INDUCTOR	2.2uH		
L704	1-414-930-21	INDUCTOR	2.2uH		
L706	1-414-938-21	INDUCTOR	47uH		
L751	1-414-934-21	INDUCTOR	10uH		
L901	1-414-940-21	INDUCTOR	100uH		
		< PHOTO INTERRUPTER >			
PH100	8-749-013-23	PHOTO INTERRUPTER GP3S120			
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120			
		< IC LINK >			
⚠PS091	1-532-727-11	LINK, IC ICP-N5 (0.25A)			
⚠PS100	1-532-727-11	LINK, IC ICP-N5 (0.25A)			
		< TRANSISTOR >			
Q001	8-729-901-06	TRANSISTOR	DTA144EK		
Q081	8-729-802-91	TRANSISTOR	2SD879		
Q091	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q		
Q092	8-729-900-51	TRANSISTOR	DTA114TK		
Q100	8-729-043-84	TRANSISTOR	PT380F3		
Q101	8-729-043-84	TRANSISTOR	PT380F3		
Q111	8-729-281-53	TRANSISTOR	2SC1815-GR		
Q201	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q202	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q203	8-729-230-49	TRANSISTOR	2SC2712-G		
Q204	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q206	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q208	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q212	8-729-421-19	TRANSISTOR	UN2213		
Q301	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q401	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q402	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q403	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q404	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q501	8-729-230-49	TRANSISTOR	2SC2712-G		
Q703	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q751	8-729-424-67	TRANSISTOR	UN2216		
Q752	8-729-424-67	TRANSISTOR	UN2216		
Q753	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q901	8-729-010-05	TRANSISTOR	MSB709-RT1		
		< RESISTOR >			
R001	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R003	1-216-097-91	RES,CHIP	100K	5%	1/10W
R004	1-216-097-91	RES,CHIP	100K	5%	1/10W
R005	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R006	1-216-105-91	RES,CHIP	220K	5%	1/10W
R007	1-216-111-00	METAL CHIP	390K	5%	1/10W
R008	1-216-097-91	RES,CHIP	100K	5%	1/10W
R009	1-216-097-91	RES,CHIP	100K	5%	1/10W
R021	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R022	1-216-117-00	METAL CHIP	680K	5%	1/10W
R023	1-216-037-00	METAL CHIP	330	5%	1/10W
R025	1-216-049-00	METAL CHIP	1K	5%	1/10W
R026	1-216-043-91	RES,CHIP	560	5%	1/10W

Ref. No.	Part No.	Description			Remark
R027	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R071	1-216-079-00	METAL CHIP	18K	5%	1/10W
R081	1-249-408-11	CARBON	180	5%	1/4W F
R082	1-249-401-11	CARBON	47	5%	1/4W F
R083	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R084	1-249-381-11	CARBON	1	5%	1/4W F
R085	1-249-396-11	CARBON	18	5%	1/4W F
R092	1-216-083-00	METAL CHIP	27K	5%	1/10W
R093	1-249-394-11	CARBON	12	5%	1/4W F
R100	1-216-089-00	METAL CHIP	47K	5%	1/10W
R101	1-249-413-11	CARBON	470	5%	1/4W F
R102	1-216-089-00	METAL CHIP	47K	5%	1/10W
R103	1-216-085-00	METAL CHIP	33K	5%	1/10W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R107	1-249-400-11	CARBON	39	5%	1/4W F
R108	1-249-400-11	CARBON	39	5%	1/4W F
R111	1-216-073-00	METAL CHIP	10K	5%	1/10W
R112	1-249-429-11	CARBON	10K	5%	1/4W
R113	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R114	1-216-073-00	METAL CHIP	10K	5%	1/10W
R130	1-216-085-00	METAL CHIP	33K	5%	1/10W
R131	1-216-085-00	METAL CHIP	33K	5%	1/10W
R132	1-216-089-00	METAL CHIP	47K	5%	1/10W
R135	1-216-089-00	METAL CHIP	47K	5%	1/10W
R136	1-216-089-00	METAL CHIP	47K	5%	1/10W
R137	1-216-089-00	METAL CHIP	47K	5%	1/10W
R138	1-216-089-00	METAL CHIP	47K	5%	1/10W
R139	1-216-081-00	METAL CHIP	22K	5%	1/10W
R141	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R142	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R143	1-247-885-00	CARBON	180K	5%	1/4W
R144	1-249-436-11	CARBON	39K	5%	1/4W
R145	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R146	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R151	1-216-081-00	METAL CHIP	22K	5%	1/10W
R160	1-216-073-00	METAL CHIP	10K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-073-00	METAL CHIP	10K	5%	1/10W
R163	1-216-073-00	METAL CHIP	10K	5%	1/10W
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W
R165	1-216-049-00	METAL CHIP	1K	5%	1/10W
R166	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R167	1-249-437-11	CARBON	47K	5%	1/4W
R168	1-216-073-00	METAL CHIP	10K	5%	1/10W
R169	1-216-073-00	METAL CHIP	10K	5%	1/10W
R172	1-249-417-11	CARBON	1K	5%	1/4W F
R173	1-249-417-11	CARBON	1K	5%	1/4W F
R174	1-249-417-11	CARBON	1K	5%	1/4W F
R175	1-216-089-00	METAL CHIP	47K	5%	1/10W
R176	1-216-049-00	METAL CHIP	1K	5%	1/10W
R177	1-216-113-00	METAL CHIP	470K	5%	1/10W
R178	1-216-295-00	METAL CHIP	0	5%	1/10W
R188	1-216-295-00	METAL CHIP	0	5%	1/10W
R189	1-216-295-00	METAL CHIP	0	5%	1/10W
R196	1-249-417-11	CARBON	1K	5%	1/4W F
R197	1-216-049-00	METAL CHIP	1K	5%	1/10W

The components identified by mark ⚠or dotted line with mark ⚠are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R198	1-216-049-00	METAL CHIP	1K	5%	1/10W
R199	1-216-049-00	METAL CHIP	1K	5%	1/10W
R203	1-249-417-11	CARBON	1K	5%	1/4W F
R204	1-216-049-00	METAL CHIP	1K	5%	1/10W
R205	1-216-049-00	METAL CHIP	1K	5%	1/10W
R206	1-216-049-00	METAL CHIP	1K	5%	1/10W
R207	1-216-089-00	METAL CHIP	47K	5%	1/10W
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R210	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R211	1-216-041-00	METAL CHIP	470	5%	1/10W
R212	1-216-045-00	METAL CHIP	680	5%	1/10W
R213	1-216-049-00	METAL CHIP	1K	5%	1/10W
R214	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R216	1-216-047-91	RES,CHIP	820	5%	1/10W
R217	1-216-041-00	METAL CHIP	470	5%	1/10W
R218	1-216-029-00	METAL CHIP	150	5%	1/10W
R219	1-249-413-11	CARBON	470	5%	1/4W F
R220	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R221	1-216-039-00	METAL CHIP	390	5%	1/10W
R222	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R223	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R226	1-247-807-31	CARBON	100	5%	1/4W
R227	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-295-00	METAL CHIP	0	5%	1/10W
R230	1-216-295-00	METAL CHIP	0	5%	1/10W
R231	1-216-295-00	METAL CHIP	0	5%	1/10W
R232	1-216-295-00	METAL CHIP	0	5%	1/10W
R233	1-216-049-00	METAL CHIP	1K	5%	1/10W
R234	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R236	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R237	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R238	1-216-295-00	METAL CHIP	0	5%	1/10W
R240	1-249-416-11	CARBON	820	5%	1/4W F
R244	1-216-047-91	RES,CHIP	820	5%	1/10W
R300	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-093-00	METAL CHIP	68K	5%	1/10W
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-036-00	METAL CHIP	300	5%	1/10W
R315	1-216-073-00	METAL CHIP	10K	5%	1/10W
R316	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R318	1-249-430-11	CARBON	12K	5%	1/4W
R319	1-216-295-00	METAL CHIP	0	5%	1/10W
R320	1-216-047-91	RES,CHIP	820	5%	1/10W
R344	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R345	1-216-081-00	METAL CHIP	22K	5%	1/10W
R346	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R347	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R348	1-216-033-00	METAL CHIP	220	5%	1/10W
R360	1-216-049-00	METAL CHIP	1K	5%	1/10W
R361	1-216-049-00	METAL CHIP	1K	5%	1/10W
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R370	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R371	1-216-689-11	METAL CHIP	39K	0.5%	1/10W

Ref. No.	Part No.	Description			Remark
R372	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R378	1-216-083-00	METAL CHIP	27K	5%	1/10W
R380	1-216-041-00	METAL CHIP	470	5%	1/10W
R381	1-216-041-00	METAL CHIP	470	5%	1/10W
R382	1-216-295-00	METAL CHIP	0	5%	1/10W
R383	1-216-295-00	METAL CHIP	0	5%	1/10W
R384	1-216-091-00	METAL CHIP	56K	5%	1/10W
R385	1-216-091-00	METAL CHIP	56K	5%	1/10W
R389	1-216-073-00	METAL CHIP	10K	5%	1/10W
R401	1-216-049-00	METAL CHIP	1K	5%	1/10W
R402	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R403	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R404	1-216-041-00	METAL CHIP	470	5%	1/10W
R405	1-216-049-00	METAL CHIP	1K	5%	1/10W
R406	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R407	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R408	1-216-049-00	METAL CHIP	1K	5%	1/10W
R409	1-216-049-00	METAL CHIP	1K	5%	1/10W
R411	1-216-089-00	METAL CHIP	47K	5%	1/10W
R412	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R413	1-216-073-00	METAL CHIP	10K	5%	1/10W
R414	1-216-073-00	METAL CHIP	10K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-121-91	RES,CHIP	1M	5%	1/10W
R417	1-247-891-00	CARBON	330K	5%	1/4W
R419	1-216-295-00	METAL CHIP	0	5%	1/10W
R420	1-216-295-00	METAL CHIP	0	5%	1/10W
R421	1-216-033-00	METAL CHIP	220	5%	1/10W
R422	1-216-025-91	RES,CHIP	100	5%	1/10W
R501	1-216-045-00	METAL CHIP	680	5%	1/10W
R502	1-216-045-00	METAL CHIP	680	5%	1/10W
R503	1-216-295-00	METAL CHIP	0	5%	1/10W
R504	1-216-295-00	METAL CHIP	0	5%	1/10W
R505	1-216-295-00	METAL CHIP	0	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R507	1-208-788-11	RES,CHIP	1.8K	0.50%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R509	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R510	1-216-073-00	METAL CHIP	10K	5%	1/10W
R511	1-216-081-00	METAL CHIP	22K	5%	1/10W
R512	1-247-863-91	CARBON	22K	5%	1/4W
R513	1-216-049-00	METAL CHIP	1K	5%	1/10W
R514	1-216-077-00	METAL CHIP	15K	5%	1/10W
R515	1-216-077-00	METAL CHIP	15K	5%	1/10W
R516	1-216-073-00	METAL CHIP	10K	5%	1/10W
R517	1-216-073-00	METAL CHIP	10K	5%	1/10W
R701	1-216-041-00	METAL CHIP	470	5%	1/10W
R702	1-216-041-00	METAL CHIP	470	5%	1/10W
R706	1-216-049-00	METAL CHIP	1K	5%	1/10W
R707	1-212-893-00	FUSIBLE	330	5%	1/4W F
R708	1-216-113-00	METAL CHIP	470K	5%	1/10W
R709	1-216-295-00	METAL CHIP	0	5%	1/10W
R710	1-216-295-00	METAL CHIP	0	5%	1/10W
R711	1-216-295-00	METAL CHIP	0	5%	1/10W
R712	1-216-295-00	METAL CHIP	0	5%	1/10W
R713	1-216-295-00	METAL CHIP	0	5%	1/10W
R714	1-216-295-00	METAL CHIP	0	5%	1/10W
R725	1-216-075-00	METAL CHIP	12K	5%	1/10W
R726	1-216-077-00	METAL CHIP	15K	5%	1/10W
R750	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

MA-325 NK-11 POWER BLOCK

Ref. No.	Part No.	Description			Remark
R752	1-216-295-00	METAL CHIP	0	5%	1/10W
R754	1-216-295-00	METAL CHIP	0	5%	1/10W
R755	1-216-295-00	METAL CHIP	0	5%	1/10W
R764	1-216-295-00	METAL CHIP	0	5%	1/10W
R901	1-216-022-00	METAL CHIP	75	5%	1/10W
R902	1-249-407-11	CARBON	150	5%	1/4W F
R904	1-249-408-11	CARBON	180	5%	1/4W F
R905	1-216-025-91	RES,CHIP	100	5%	1/10W
R906	1-216-022-00	METAL CHIP	75	5%	1/10W
R907	1-216-041-00	METAL CHIP	470	5%	1/10W
R908	1-216-041-00	METAL CHIP	470	5%	1/10W
R909	1-216-097-91	RES,CHIP	100K	5%	1/10W
R910	1-216-097-91	RES,CHIP	100K	5%	1/10W
R911	1-216-097-91	RES,CHIP	100K	5%	1/10W
R912	1-216-097-91	RES,CHIP	100K	5%	1/10W
R913	1-216-089-00	METAL CHIP	47K	5%	1/10W
R914	1-216-089-00	METAL CHIP	47K	5%	1/10W
R915	1-216-295-00	METAL CHIP	0	5%	1/10W
R916	1-216-295-00	METAL CHIP	0	5%	1/10W
		< SWITCH >			
S100	1-771-155-11	SWITCH, ROTARY (CAM ENCODER)			
S101	1-762-108-11	SWITCH, PUSH (1 KEY) (REC PRF)			
S701	1-571-588-11	SWITCH, SLIDE (RF UNIT)			
		< TRANSFORMER >			
T081	1-431-100-11	TRANSFORMER, BIAS OSCILLATION			
T091	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			
		< TUNER >			
TU701	1-693-413-11	TUNER, MOD/IF SOLID TYPE			
		< VIBRATOR >			
X161	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)			
X202	1-577-380-11	VIBRATOR, CRYSTAL (3.579545MHz)			
X401	1-577-381-11	VIBRATOR, CRYSTAL (14318.18kHz)			
*	A-6791-591-A	NK-11 BOARD, COMPLETE			
		**********			
		(Ref.No.1,000 Series)			
		< CAPACITOR >			
C003	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C004	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C005	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C006	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C007	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C008	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C009	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C010	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C011	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C012	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C014	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C015	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C016	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C017	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V

Ref. No.	Part No.	Description			Remark
C018	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C019	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C020	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C021	1-113-642-11	TANTAL. CHIP	47uF	10%	10V
C022	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C023	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
		< CONNECTOR >			
* CN001	1-691-183-11	CONNECTOR (BOARD TO BOARD) 13P			
		< DIODE >			
D001	8-719-066-72	DIODE BB135			
		< FERRITE BEAD >			
FB001	1-543-813-21	FERRITE	0UH		
FB002	1-543-813-21	FERRITE	0UH		
FB003	1-543-813-21	FERRITE	0UH		
		< IC >			
IC001	8-759-526-43	IC TDA9874H/V1,118			
		< COIL >			
L006	1-412-945-11	INDUCTOR	3.3uH		
		< IC LINK >			
⚠PS001	1-576-122-21	LINK, IC CCP2E10 (0.4A)			
		< RESISTOR >			
R001	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R002	1-216-073-00	METAL CHIP	10K	5%	1/10W
R003	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R004	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R005	1-216-041-00	METAL CHIP	470	5%	1/10W
R006	1-216-041-00	METAL CHIP	470	5%	1/10W
R007	1-216-001-00	METAL CHIP	10	5%	1/10W
R008	1-216-001-00	METAL CHIP	10	5%	1/10W
R009	1-216-001-00	METAL CHIP	10	5%	1/10W
R010	1-216-001-00	METAL CHIP	10	5%	1/10W
R011	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R012	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R013	1-216-001-00	METAL CHIP	10	5%	1/10W
R014	1-216-295-00	METAL CHIP	0	5%	1/10W
R015	1-216-295-00	METAL CHIP	0	5%	1/10W
R016	1-216-033-00	METAL CHIP	220	5%	1/10W
		< VIBRATOR >			
X001	1-767-897-11	VIBRATOR, CRYSTAL (24.576MHz)			
*	1-468-311-11	POWER BLOCK (SR-718)			
		**********			
		(Ref.No. 4,000 Series)			
		< CAPACITOR >			
C112	1-130-495-51	FILM	0.1uF		50V
C114	1-130-495-51	FILM	0.1uF		50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
C115	1-130-495-51	FILM	0.1uF	50V		
		< DIODE >				
⚠D107	9-900-534-01	DIODE ERA18-02				
⚠D108	9-900-534-01	DIODE ERA18-02				
⚠D205	9-900-534-01	DIODE ERA18-02				
		< FUSE >				
⚠F101	1-532-388-31	FUSE (2.0A/250V)				
		< IC >				
⚠IC201	8-759-420-19	IC AN1431T				
		< PHOTO COUPLER >				
⚠PC101	8-749-924-84	COUPLER, PHOTO PS2561				
		< RESISTOR >				
R208	9-908-233-01	FUSIBLE	0.47	1/4W		
*	A-6791-700-A	PS-414 BOARD, COMPLETE				
		**********				
		(Ref.No.1,000 Series)				
		< CAPACITOR >				
C600	1-126-163-11	ELECT	4.7uF	20%	50V	
C601	1-124-248-00	ELECT	22uF	20%	35V	
C602	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C603	1-126-934-11	ELECT	220uF	20%	16V	
C604	1-124-589-11	ELECT	47uF	20%	16V	
C605	1-126-934-11	ELECT	220uF	20%	16V	
C606	1-124-589-11	ELECT	47uF	20%	16V	
C608	1-124-584-00	ELECT	100uF	20%	10V	
C609	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		< CONNECTOR >				
CN600	1-784-946-11	CONNECTOR, BOARD TO BOARD 9P				
CN601	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P				
		< DIODE >				
D600	8-719-911-19	DIODE 1SS119				
D601	8-719-911-19	DIODE 1SS119				
D602	8-719-109-84	DIODE RD5.1ES-B1				
		< IC >				
IC600	8-759-438-18	IC PQ12RD08				
		< COIL >				
L600	1-414-939-21	INDUCTOR	68uH			
L601	1-414-934-21	INDUCTOR	10uH			
		< IC LINK >				
⚠PS600	1-533-593-11	LINK, IC 491002 (2A)				
⚠PS601	1-533-586-31	LINK, IC 491.315 (315mA)				

Ref. No.	Part No.	Description				Remark
		< TRANSISTOR >				
Q600	8-729-140-93	TRANSISTOR	2SB733-34			
Q601	8-729-421-19	TRANSISTOR	UN2213			
Q602	8-729-018-99	TRANSISTOR	2SD2394-F			
Q603	8-729-119-79	TRANSISTOR	2SC2785-FEK			
		< RESISTOR >				
R600	1-249-417-11	CARBON	1K	5%	1/4W	F
R601	1-216-430-11	METAL OXIDE	390	5%	1W	F
R602	1-249-417-11	CARBON	1K	5%	1/4W	F
R603	1-216-295-00	METAL CHIP	0	5%	1/10W	
R605	1-249-414-11	CARBON	560	5%	1/4W	F
R606	1-247-815-91	CARBON	220	5%	1/4W	
R607	1-247-815-91	CARBON	220	5%	1/4W	
R608	1-215-908-00	METAL OXIDE	33	5%	3W	F
R609	1-215-857-11	METAL OXIDE	10	5%	1W	F
R610	1-249-417-11	CARBON	1K	5%	1/4W	F
*	A-6791-642-A	RJ-79 BOARD, COMPLETE				
		**********				
		(Ref.No.1,000 Series)				
		< CONNECTOR >				
CN951	1-506-485-11	PIN, CONNECTOR 6P				
		< JACK >				
CNJ953	1-784-816-11	JACK, PIN 2P (LINE-2 OUT)				
		< DIODE >				
D951	8-719-109-93	DIODE RD6.2ES-B2				
D952	8-719-109-93	DIODE RD6.2ES-B2				
		< RESISTOR >				
R956	1-216-041-00	METAL CHIP	470	5%	1/10W	
R957	1-216-041-00	METAL CHIP	470	5%	1/10W	
*	A-6791-655-A	SW-307 BOARD, COMPLETE (ED9)				
		**********				
		(Ref.No.1,000 Series)				
		< CAPACITOR >				
C400	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
		< CONNECTOR >				
CN400	1-784-484-11	CONNECTOR, FFC/FPC 5P				
		< DIODE >				
D400	8-719-056-07	DIODE SLR-342MCT31 (POWER)				
		< IC >				
IC400	8-749-011-05	IC GP1U28X				
		< TRANSISTOR >				
Q400	8-729-421-19	TRANSISTOR	UN2213			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SW-307

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R400	1-216-029-00	METAL CHIP	150	5%	1/10W
R401	1-216-295-00	METAL CHIP	0	5%	1/10W
		< SWITCH >			
S400	1-762-196-21	SWITCH, TACT (POWER)			
		MISCELLANEOUS			
		**********			
11	1-783-849-11	CABLE, FLAT (FMF-30) (ED8)			
16	1-762-844-21	SWITCH, ROTARY (ED8)			
53	1-475-836-11	SWITCH BLOCK, CONTROL (ED9)			
57	1-762-844-21	SWITCH, ROTARY (ED9)			
63	1-783-851-11	CABLE, FLAT (FFS-6) (ED9)			
66	1-783-850-11	CABLE, FLAT (FFD-3) (ED9)			
68	1-783-849-11	CABLE, FLAT (FMF-30) (ED9)			
⚠109	1-782-752-11	CORD, POWER			
113	1-766-725-11	CONNECTOR, BOARD TO BOAR 5P			
704	1-500-144-11	HEAD, FE			
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)			
768	8-839-044-02	DRUM ASSY DZH-94A/ZRP			
M902	1-698-971-11	MOTOR, DC (CAPSTAN)			
M903	X-3947-577-1	MOTOR ASSY, CAM			
		**********			
		HARDWARE LIST			
		**********			
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3			
#2	7-682-147-01	SCREW +P 3X6			
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			
#4	7-685-133-19	SCREW (DIA. 2.6) (IT3B)			

ACCESSORIES & PACKING MATERIALS
****

1-475-612-21	COMMANDER, STANDARD (RMT-V244) (ED9)
1-475-615-11	COMMANDER, STANDARD (RMT-V246) (ED8)
1-696-592-11	CORD, CONNECTION (NTSC)
1-776-258-11	CORD, AVC CONNECTION
3-861-811-11	MANUAL, INSTRUCTION (KOREAN) (ED9)
3-861-812-11	MANUAL, INSTRUCTION (KOREAN) (ED8)

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Replace only with part number specified.

9-921-703-11

Sony Corporation
Home A&V Products Company

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